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THE PREVENTION OF DIABETES MELLITUS

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On the broad street of a certain peaceful New England village there once stood three houses side by side, as commodious and attractive as any in the town. Into these three houses moved in succession four women and three men—heads of families—and of this number all but one subsequently succumbed to diabetes. The remaining member of the group died of cancer of the stomach at the age of 77 years. A search for the cause of these deaths, untimely in the majority of instances, led to the accumulation of the data on which this paper is based. From the conclusions which the present analysis of 1,000 cases of diabetes suggests, it is hoped that eventually many similar deaths from diabetes mellitus can be prevented.

Although six of seven persons dwelling in these adjoining houses died from a single cause, no one spoke of an epidemic. Contrast the activities of the local and state boards of health if these deaths had occurred from scarlet fever, typhoid fever or tuberculosis. Consider the measures that would have been adopted to discover the source of the outbreak and to prevent a recurrence. Because the disease was diabetes and because the deaths occurred over a considerable interval of time, the fatalities passed unnoticed. Even the insurance companies failed to grasp their significance, and yet probably no group of individuals in the community carried pro rata a higher amount of insurance than did these six diabetics. Has one not a right to expect boards of health and insurance companies to make at least an attempt to prevent similar losses?

Perhaps one reason for this apparent negligence is the widespread pessimism concerning the possibility of prevention of chronic diseases in the latter half of life, in contrast to the optimism prevalent concerning the results accomplished in the prevention of acute infectious diseases in the early decades. It is true that statistics in the past have fostered this view, but that is no reason for believing they will support it in the future. Infectious diseases have been so thoroughly exploited that today the time is opportune to attack the problem of the chronic diseases on which already years of patient labor have been expended, with progress too little appreciated.

There are entirely too many diabetic patients in the country. Statistics for the last thirty years show so great an increase in the number that, unless this were in part explained by a better recognition of the disease, the outlook for the future would be startling. In 1900 the death rate from diabetes in the registration area of the United States was 10 per hundred thousand, and in 1915, 18 per hundred thousand. In the same period in Boston, it rose from 14 to 26 on the same basis. There are probably more than half a million diabetics in the United States. Therefore, it is proper at the present time to devote attention not alone to treatment, but still more, as in the campaign against typhoid fever, to prevention. The results may not be quite so striking or as immediate, but they are sure to come and to be important.

In seeking for means to avoid diabetes, one naturally inquires how, in the example of the country town cited above, the one who escaped the disease differed from the six who had it. What was there in the habits and temperament of this person to render him immune? All knowing the group would unhesitatingly answer that this one individual was of normal weight, and the others who developed diabetes were fat. Therefore, in what follows, obesity and its relation to diabetes will be discussed.

THE RELATION OF OBESITY TO DIABETES

The association of obesity and diabetes has long been noted. A few years ago an analysis of 1,063 of my own cases showed that in more than 40 per cent. of the number marked obesity preceded the outbreak of the disease, and the prediction was made that if more exact data were available the percentage would be fully twice as great. Writers generally have observed this connection, and von Noorden not only emphasized the necessity of examining the urines of fat persons for sugar, but also suggested that examinations of the blood sugar of fat persons would disclose their approach to the disease when the urine was sugar free. In other words, a prediabetic stage in fat persons has been recognized. But the closeness of the dependence of diabetes on obesity demands still more elucidation.

Recently, while compiling the data for age, height and weight of a series of 118 diabetics whose respiratory metabolism had been studied at the Nutrition Laboratory of the Carnegie Institution, it was found that persons above the age of 50 rarely acquired diabetes if their weight remained a little below normal, and, in general, the connection between obesity and diabetes was even more intimate than the literature showed. These statistics, although striking, were too few for generalities. Therefore, data from 1,000 successive cases of diabetes in which the age, weight and height were known have been compiled and are reported in this paper.

Such extensive and inclusive data have not been published heretofore. Even if one searches the best of the monographs on diabetes it will be found that the case records, while giving the weight, frequently fail to give the height. This unfortunate practice is not limited to diabetes. Indeed, it is only too true that during

life patients are weighed, and at death they are measured, but in neither life nor death are both height and weight taken. This may explain why the data in this series of 1,000 cases throw additional light on obesity as a predisposing cause of diabetes, and at the same time suggest how the disease may be prevented.

COMPARISON OF DIABETICS AND NORMAL PERSONS BY WEIGHT

In comparing the weights of 1,000 cases of diabetes with normal persons, the tables were employed which are published by the Association of Life Insurance Directors and Actuaries of America [1] for those of 15 years or over, the tables of Wood [2] for those between 4 and 15 years of age, and those of Crum [3] for children up to and including the fourth year. In view of the errors incidental to clothes and heels and the inaccuracies on the part of the patient or friends, it seemed best to substitute for the normal average figure a normal zone extending from 5 per cent. below to 5 per cent. above it. Thus, if 100 pounds was shown in one of the tables as the normal weight, the normal zone would extend from 95 to 105 pounds. The percentages of weight below or above this normal zone are based on a comparison of the diabetic's age, height and maximum weight with the standard weight for the same age, height and sex. The maximum weight was usually coincident with the onset of diabetes. Regarding the maximum weight, care was particularly exercised to repeat the question in securing information, because patients are often forgetful, do not know, or hesitate to give the upper limit. Thus, a woman may state that her weight is the highest ever reached on the day of observation and give this as 160 pounds, whereas the scales show that it is 200 pounds. Regarding the height, also, the statements of the patients are most unreliable. An error of an inch would vitiate considerably the value of the conclusion. Consequently, it has been an invariable practice actually to measure the height.

When Table 1 is read from left to right, it will be seen that in the first column are arranged the decades of onset. In the next column come the total number of cases in the decade. And next, arranged on each side of the standard weight zone, are columns showing the number of persons who are a given percentage below or above it. The last column to the right gives for each decade the percentage of the persons in that decade who were more than 5 per cent. below normal weight. Reading now across the lowest line of the table, we see the total number of cases for each percentage group below and above the standard.

1. Association of Life Insurance Directors and Actuaries of America, New York **1**: 38, 67, 1912.
2. The Ninth Year Book of the National Society for the Study of Education, Part I, Health and Education, Chicago, 1910, p. 34.
3. Quarterly Publication of the American Statistical Association, Boston **15**: 332, No. 115, 1916.

The table shows that among 1,000 diabetic persons there was no instance in which diabetes occurred when the maximum weight was 31 or more per cent. below the normal zone, whereas there were 273 persons who developed the disease among those who were 30 or more per cent. above it.

If one examines the next pair of groups nearer the normal zone, namely, those between 21 to 30 per cent. below and above normal, it will be seen that these contain five cases below the normal in contrast to 169 above normal. Consolidating this pair of groups with those mentioned in the preceding paragraph, one might add that of 1,000 persons with diabetes there were only five who showed a maximum weight 21 or more per cent. below normal, while there were as many as 394 whose maximum weight was 21 or more per cent. above normal. Therefore, in this series, when the persons were 21 or more per cent. overweight, diabetes occurred seventy-nine times as frequently as when in the corresponding degree of underweight.

When analyzing the cases studied at the Nutrition Laboratory, I was challenged by the fact that no person above the age of 50 acquired diabetes whose maximum weight had remained 21 per cent. below the normal standard. It may be asserted that there are comparatively few persons in the community who are 21 or more per cent. below average weight, and that this accounts for the disparity. At the moment, no wholly satisfactory statistics are at my disposal to refute this assertion, because for these groups the statistics of insurance companies may not mirror the actual distribution by weight of the population as a whole. Fortunately, however, satisfactory data are available to

TABLE 1.—VARIATION FROM NORMAL OF MAXIMUM WEIGHTS, AT OR PRIOR TO ONSET, OF ONE THOUSAND CASES OF DIABETES, CALCULATED FOR HEIGHT, AGE AND SEX

Age, Years	Number of Cases	Below Standard Weight, per Cent. 30-21	20-11	10-6	Normal Average Zone, per Cent. +5 −5	Above Standard Weight, per Cent. 6-10	11-20	21-30	31-40	41-50	51-60	61-70	71+	Percentage of Each Decade Below Normal Zone
1-10	16	0	3	2	5	3	2	..	..	1	..	..	..	31
11-20	59	2	11	8	24	6	4	2	1	..	1	..	..	36
21-30	131	..	15	13	41	15	29	9	4	..	3	..	2	71
31-40	178	1	9	12	28	22	34	25	15	14	10	6	2	12
41-50	291	2	8	7	31	19	59	50	40	30	18	10	8	6
51-60	223	..	4	7	16	28	39	48	45	14	13	5	4	5
61-70	84	..	..	2	3	10	17	23	14	7	1	1	1	2
71-80	18	..	..	1	6	3	2	3	2	1	..	..	..	6
1-80	1,000	5	50	52	159	106	186	169	121	67	46	22	17	

TABLE 2.—NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY MORTALITY INVESTIGATION, 1844-1905 *

Weight	No. of Persons
Normal	19,008
5 per cent. under	22,602
10 per cent. under	24,378
15 per cent. under	18,423
20 per cent. under	6,387
25 per cent. under	1,631
30 per cent. under	160
35 per cent. under	16
40 per cent under	4
5 per cent. over	14,379
10 per cent. over	9,437
15 per cent. over	6,704
20 per cent. over	4,441
25 per cent. over	2,840
30 per cent. over	1,521
35 per cent. over	843
40 per cent. over	356
45 per cent. over	161
50 per cent over	85
55 per cent. over	49
60 per cent. over	56
Total	136,249

* These statistics are "based upon insured lives and so represent healthy, selected individuals who have passed examinations for life insurance."

show the percentage of persons in the community who are in the next groups 6 to 20 per cent. below weight and 6 to 20 per cent. above weight (Tables 2 and 3). These tables were brought to my attention by the courtesy of Dr. Edwin Welles Dwight, medical director of

TABLE 3.—MEDICO-ACTUARIAL MORTALITY INVESTIGATION, 1885-1908 INCLUSIVE*

Variation from Average Weight in Pounds	Number of Persons
—50 and more	1,685
—35 to —45	57,737
—25 to —30	207,488
—15 to —20	299,905
—10	28,894
— 5	28,186
Average	24,525
+ 5	20,417
+10	16,453
+15 to +20	22,363
+25 to +30	14,520
+35 to +45	54,795
+50 to +60	45,417
+65 to +80	12,119
+85 and more	1,775
Total	744,672

* These statistics are "based upon insured lives and so represent healthy, selected individuals who have passed examinations for life insurance."

per cent. above weight are from six to twelve times as liable to diabetes as their counterparts in the same group below weight.

The table as a whole shows that of the 1,000 diabetics considered, the maximum weights of only 10 per cent. were below the standard weight zone, while 15 per cent. came in that zone and 75 per cent. above it.

If one examines by decades the relative proportion of those contracting diabetes who were 6 or more per cent. underweight, it is evident that as the decades advance the proportion changes from 30 per cent. to 2 per cent. There was but one patient out of eighteen underweight in the eighth decade. It is questionable whether a new series of 1,000 cases, with substandard persons more in mind, would show such wide variation between the early and the late decades. Great pains must be taken to secure the data of children, and repeated cross-questioning of the parents is necessary to secure reliable data. This subject will receive further attention in this paper.

For convenience, standard weight tables for adult males and females with clothes and heels are inserted (Tables 4 and 5).

TABLE 4.—GRADED AVERAGE WEIGHT OF MEN*

Age Group	5 Ft.	5 Ft. 1 In.	5 Ft. 2 In.	5 Ft. 3 In.	5 Ft. 4 In.	5 Ft. 5 In.	5 Ft. 6 In.	5 Ft. 7 In.	5 Ft. 8 In.	5 Ft. 9 In.	5 Ft. 10 In.	5 Ft. 11 In.	6 Ft.	6 Ft. 1 In.	6 Ft. 2 In.	6 Ft. 3 In.	6 Ft. 4 In.	6 Ft. 5 In.
15-19	113	115	118	121	124	128	132	136	140	144	148	153	158	163	168	173	178	183
20-24	119	121	124	127	131	135	139	142	146	150	154	158	163	168	173	178	183	188
25-29	124	126	128	131	134	138	142	146	150	154	158	163	169	175	181	187	192	197
30-34	127	129	131	134	137	141	145	149	154	158	163	168	174	180	186	192	198	203
35-39	129	131	133	136	140	144	148	152	157	162	167	172	178	184	191	197	203	209
40-44	132	134	136	139	143	146	150	154	159	164	169	175	181	187	194	201	208	214
45-49	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
50-51	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218

TABLE 5.—GRADED AVERAGE WEIGHT OF WOMEN

Age Group	4 Ft. 8 In.	4 Ft. 9 In.	4 Ft. 10 In.	4 Ft. 11 In.	5 Ft.	5 Ft. 1 In.	5 Ft. 2 In.	5 Ft. 3 In.	5 Ft. 4 In.	5 Ft. 5 In.	5 Ft. 6 In.	5 Ft. 7 In.	5 Ft. 8 In.	5 Ft. 9 In.	5 Ft. 10 In.	5 Ft. 11 In.	6 Ft.
15-19	104	106	108	110	112	114	117	120	123	126	130	134	138	141	145	150	155
20-24	107	109	111	113	115	117	120	123	126	129	133	137	141	145	149	153	157
25-29	110	112	114	116	118	120	123	125	129	132	136	140	144	148	152	155	159
30-34	113	115	117	119	121	123	125	128	132	136	140	144	148	152	155	158	162
35-39	116	118	120	122	124	126	129	132	136	140	144	148	152	156	159	162	165
40-44	120	122	124	126	128	130	133	136	139	143	147	151	155	159	162	166	169
45-49	122	125	127	129	131	133	136	139	142	146	151	155	159	163	166	170	173
50-54	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177

* Tables 4 and 5 are Table III, page 37, and Table VIII, page 66, of the Medico-Actuarial Mortality Investigation, Volume I, compiled and published by the Association of Life Insurance Medical Directors and Actuarial Society of America, New York, 1912.

the New England Life Insurance Company, who repeatedly has aided me in my statistical studies. It is proper to add that Dr. Dwight is not responsible for my conclusions. Of 136,249 insured healthy persons of the New England Mutual Life Insurance Company Mortality Investigation between the years 1844 and 1905, there were 74,670 who were from 5 to 20 per cent. below weight, and less than one half that number, 34,961, who were 5 to 20 per cent. above weight. Similarly, of 744,672 persons of the Medico-Actuarial Mortality Investigation, 1885-1908 inclusive, there were 472,271 who were from 5 to 30 pounds (not per cent.) below normal, and less than one sixth, 59,228, in the corresponding group above normal. Therefore, if weight were not a factor in the development of diabetes, one might expect to find twice (New England Mutual) or about six times (Medico-Actuarial) as many diabetics among the substandards as among the overweights.

Look at the facts. The table shows quite the reverse. In the 6 to 20 per cent. group underweight there are 102 cases, but in the corresponding group overweight there are 292 cases, or three times as many. Hence, persons in the community at large who are from 6 to 20

DIABETES—A PENALTY OF OBESITY

Diabetes, therefore, is largely a penalty of obesity, and the greater the obesity, the more likely is Nature to enforce it. The sooner this is realized by physicians and the laity, the sooner will the advancing frequency of diabetes be checked. The penalty of taking too much alcohol is well known, and a drunkard is looked on with pity or contempt. Rarely persons who become fat deserve pity because of a real tendency to put on weight despite moderate eating, but usually most should be placed in somewhat the same category as the alcoholic. In the next generation one may be almost ashamed to have diabetes. Jewish patients, sometimes hypersensitive to physical ills, but often rightly anxious to take things in time, are already beginning to realize this fact. I was recently told by the relative of one patient who died under distressing circumstances following laxity in diet that the man's one desire was to avoid a death from diabetes, because this had been so common in his ancestry. It is all nonsense to use polite terms for being "just fat." It is generally prudent and always far more effective to say to the patient: "You are too fat," than cautiously to remark: "You are a trifle obese." Fat diathesis! Granted there is one

person in a thousand who has some inherent peculiarity of the metabolism which has led to obesity, there are 999 for whom being fat implies too much food or too little exercise, or both combined.

THE SUBSTANDARD WEIGHT PATIENTS

Patients in the table who developed diabetes, though underweight, furnish a group for very particular study. They should represent a purer, simpler type of the disease. As this fact is now realized, subsequent cases falling into this class will be better analyzed and the number possibly reduced in size. On investigation of this series I have already found that twenty-nine of the 107 were really doubtful diabetics according to the more accurate standards of today. They include that dangerous group, "renal" diabetics, "insurance" diabetics who are sometimes accepted as risks, and other extremely mild cases. There may be further reductions because a considerable number probably weighed more than is recorded, for the tendency of the statistical error, as has been already said, is in the understatement rather than the overstatement of weight. An hereditary and familial element was present in twenty-four, and among these there were eight examples of more than one case in the family. Several cases showed stigmas of degeneracy, and it is my impression that greater familiarity on my part with such signs would increase the number that should be classed in this way. Conversely, there were several extraordinarily severe cases, and yet in some of these very cases in which the disease appeared severe, the patients withstood it for an unusually long period. Indeed, it would seem justifiable to formulate this diabetic law: *It is rare for diabetes to develop in an individual above the age of 20 years who is habitually underweight, and when it does so develop the case will usually be found to be either extremely severe, extremely mild, or associated with a marked hereditary taint or degenerative stigmas.* The tendency to diabetes appears to be congenital. It is most intense in childhood; but, escaping that period, the individual is less and less likely to acquire the disease if he remains underweight, whereas in the obese the tendency finds a fertile soil. In the fat the predisposition may be no greater, but the external cause is more provocative.

Nervous excitement or nervous strain has also been considered a factor in the etiology of diabetes. It is notable, however, that soldiers returning from the front did not show sugar in the urine. About 40,000 passed through the hospital center in France where I was consultant; yet, though the urines were systematically examined, but two cases of diabetes were discovered. It will be important to note the incidence of diabetes in the same soldiers at a period some months later when added weight was the rule. On the other hand, it is true that a good many cases have come under observation of children who have stood exceptionally high in their classes at school and have later developed the disease. Perhaps the number is relatively small when compared with the great number of schoolchildren, but these cases have made a deep impression on the writer.

OBESITY PREDOMINANT IN OTHER FACTORS OFTEN MENTIONED IN THE ETIOLOGY OF DIABETES

The preponderating influence of obesity in the development of diabetes explains various peculiarities in diabetic case histories and furnishes a new point of view from which to regard them.

1. *Conjugal Diabetes.*—Of eighteen persons concerned in my series there was but one who was thin. Husband and wife were alike fat, and the implication is strong that they contracted the disease from exposure to good food rather than to one another.

2. *Frequency of Diabetes in the Jewish Race.*—One has only to visit the Jewish quarter of a large city to be impressed with the frequency of obesity. Overfeeding begins in childhood and lasts to old age. Very likely with the increasing affluence of the Jewish race in this country, permitting indulgence in their well-known fondness for style, obesity will tend to diminish and along with it diabetes. The fashion plate makers are far ahead of insurance company presidents in their propaganda for a normal weight. All one needs to do is to glance at the morning paper to see ladies and gentlemen portrayed for our benefit whose sylphlike figures are models of weight and height—nay, more, they are invariably a trifle below the standard weight and so might bear the legend: "Immune to diabetes." Already obesity is seen less among the well-to-do than formerly. This applies not alone to the Jewish race, but to all races.

3. *Frequency of Diabetes Among the Richer Classes of Society.*—This was exemplified in the six persons cited in the opening sentences of the paper. At the time these individuals lived, ideas of exercise for pleasure and the benefit of the body had not penetrated this rural region. Consequently, in this as in many other New England villages, though fortunately to a less extent now, the well-to-do were unusually fat. In fact, even today it is common observation to note that country families tend more to obesity than their city cousins of similar means.

4. *Heredity.*—This may simply mean unusual exposure to an obetic environment. One should not forget that obesity is usually an acquired characteristic, and acquired characteristics are little subject to transmission from parent to child. The handicap of a diabetic heredity may be to a considerable extent counteracted by avoidance of overweight. What a comfort and stimulus to diabetic parents and gain to their children!

5. *Mental Workers in Contradistinction to Physical Workers.*—The former are more likely to be fat. But the probability of more frequent urinary examinations among the more intelligent and city dwellers might explain the apparent increase in frequency. Worms said that diabetes was so frequent among the mentally active in Paris that one in ten had the disease.

6. *A Sequel to Infectious Diseases.*—Convalescents have big appetites, and unfortunately are almost fanatically overfed during a period of forced inactivity and at the very time when the pancreas must necessarily, like the rest of the body, be in a vulnerable state.

7. *Diabetes and Gout.*—Is it usual to see gout in the thin?

8. *Rarity of Syphilis in Diabetes.*—Statistics of the Peter Bent Brigham Hospital, those of von Noorden, and my own all agree in this regard—that syphilis is less common in diabetics than in the general population. Although data on the weights of syphilitic patients are not known to me, it is possible, first, that those who acquire the disease are more often thin than fat, and, secondly, that they more often lose than gain weight after the disease has fully developed. Who weighs and measures syphilitics? However, the shorter duration of life of patients with tuberculosis, cancer and syphilis in part explains the decreased frequency of diabetes in their presence.

9. *Age.*—The second decade of Table 1 proves an exception to those which follow in that there were more patients who developed diabetes above the standard weight than below it. This is almost the case in the first decade as well. In fact, obesity appears to play no part at this age, and so far as present evidence is available it must be acknowledged that these decades constitute an argument against the importance of obesity as a predisposing factor in the development of diabetes. Life insurance tables for prediction of longevity also give preference to persons in the first, second, third and even a part of the fourth decade who are slightly above normal weight. Until more data concerning diabetic children are acquired, it is necessary to be cautious about conclusions, either pro or con, regarding obesity and diabetes at this age. In explanation of the many cases of diabetes in children who were not obese is Naunyn's conception of the virulence of the diabetic tendency in childhood which leads it to break forth without an external stimulus. Of the correctness of this interpretation, however, I am not quite convinced. It is possible that even here obesity is more of a predisposing agency than would appear. It might well be that a future compilation of children's cases would avoid errors of heights and weights unnoticed in this series, which began many years ago, when the cross-questioning of parents was less searching. The maximum weight of a child is even less frequently known than that of an adult. It should also be stated that in order to secure 1,000 cases with definite data it has been necessary to exclude from the entire group of diabetics more cases from the first decade than from the others. Likewise, in the second decade there is an added source of error because here more rapid accessions of weight occur and the peaks of these accessions often escape record. The subsequent histories of children once overweight should be compared with those of normal weight or below weight, and the incidence of diabetes in each group determined. Finally, the total number of cases in these decades is relatively small, making conclusions less justifiable. In the future, the proportion of cases of diabetes in children compared with diabetes in later years will probably continue to increase. Thus, if one examines the distribution by decades of onset of the disease prior to von Noorden's time, it will be found that six writers with an extensive diabetic practice recorded an average of only 0.7 per cent. of all their cases as occurring in the first decade. Von Noorden's clientele showed 1.9 per cent., while, in my more recent series ending in 1917, this had risen to 4.7. Likewise, in the second decade fall 8.3 per cent. of my cases, nearly twice the figure of most former observers. The relative disproportion of diabetes by age is, therefore rapidly disappearing. At present the most common decades of onset are the fifth and sixth, in which the outstanding peculiarity, according to my table is that there are more cases markedly overweight than in the other decades.

POSSIBILITY OF PREVENTING MOST CASES OF DIABETES

In the presence of a wasting disease, diabetes is almost unknown. With the advent of tuberculosis and cancer, it may almost disappear. This is the foundation for the modern treatment suggested by Dr. Allen, who substituted for these wasting diseases the symptom, emaciation, without the disease. If the principle of low nutrition is effective in treatment, how much more will it be effective in prevention! And this the statistics of these 1,000 cases prove.

Real headway against the ravages of a disease begins with its prevention rather than with its treatment. Prevention implies a knowledge of the predisposing agency. Overweight is a predisposition to diabetes. The individual overweight is at least twice, and at some ages forty times, as liable to the disease. For the prevention of more than half of the cases of diabetes in this country, no radical undernutrition is necessary; the individual is simply asked to maintain the weight of his average fellow man.

The diffusion of knowledge about the disadvantages of overweight should be popularized. The Chicago class in obesity conducted by the city board of health was a splendid step in this direction, and so was F. G. Brigham's suggestion at an alumni dinner that each of the Colgate alumni should be assessed for a contribution to their alumni fund of $5 for each inch girth measure in excess of 36 inches.

The physician should take pride in the prevention of diabetes in his practice. Obese patients should be frankly told that they are candidates for diabetes. The physician should consider it as important to prevent his patients acquiring diabetes as he feels it incumbent on himself to vaccinate them against smallpox or typhoid fever, or to protect them from exposure to tuberculosis. Not only is it a duty for physicians to do this, but it is a privilege, the adoption of which will instantly redound to the credit of the physician himself in the eyes of his patients. The physician who has suffered from his inability to combat the disease successfully will welcome the opportunity of preventing its development in those susceptible to it.

But it is to the diabetic patient and his relatives that one can look most confidently for help in preventing diabetes. They know the disease and can be counted on. and should be encouraged to disseminate information about its prevention. They do not wish other members of their families to acquire it. They will be thankful to protect their friends. With these they come in contact in health and in time, and not, as the physician, in disease and too late. We do not half realize the possibilities of using diabetic patients as apostles of food hygiene. It is a question of life or death for these diabetic patients to know food values, and none better than they realize the harm of excess of weight. The diabetic, therefore, is a good teacher, and diabetic patients outnumber the physicians more than 5 to 1. Our teachers, however, must be guided, and cautions must be issued against rapid or extreme loss of weight. Indeed, today the potential power of the diabetics in this country for good almost offsets the harm that results from their having the disease. Such measures, however, are but general, and they will never suffice for the prediabetic. These should be more concrete.

A PLEA FOR EARLY DIAGNOSIS

It is well known that diabetic patients come too late for treatment. If the disease is detected early it is far more susceptible to diet. It is easier to diagnose than tuberculosis. Funck deplored the scant attention paid to the discovery of a trace of sugar in the urine, which was often more a harbinger of death than an apical tuberculosis. How considerable was the interval between the date of the onset and the beginning of treatment can be inferred by the loss of weight that occurred during this period in 600 of my cases. The reduction below the maximum weight amounted on the average to 30 pounds. One of the reasons for this delay in diagnosis is the neglect of frequent or routine urinary examinations. Thus, in the last seventy-seven

cases of diabetes, in which the patients were especially questioned with this in view, it was found that in thirty instances there had been no urinary examination before the disease was discovered, and in eighteen instances the interval since the previous examination was three or more years. Therefore, it is necessary to establish the custom of urinary examinations being made more frequently and more universally. Every one should have the urine examined on his or her birthday. More energy must be exerted to discover this disease. One must hunt for it. How easily new cases of diabetes can be brought to light, the subjoined incident will disclose:

March 30, 1920, there came to my office a woman with diabetes. She was given the usual examination with suggestions for treatment, and as it was impracticable for her to enter the hospital, she was taught on the spot to examine her urine. She went home and shortly after contracted pneumonia and died. But in the intervening days amid her household cares she found time and took enough interest to examine the urines of ten others in her boarding house, and in so doing discovered the presence of diabetes in a boy. She gave him sound advice and sent him to his own physician, who also subsequently died, and a few days ago the boy came to me, telling this story. On the day she learned the Benedict test and made these ten urinary examinations for her friends, Louisa Drumm was 79 years and 4 months old! Can one not appropriately say to younger diabetic patients: "Go thou and do likewise"?

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THE FUNDAMENTAL CLASSIFICATION OF DISEASE BY THE BASAL METABOLIC RATE *

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The basal metabolic rate is a measurement of the heat production in an individual under standard conditions; like the temperature, therefore, it is a measurement of certain heat phenomena inherent in the living organism. Just as the thermometer divides diseases into the febrile and afebrile groups, so the basal metabolic rate differentiates diseases into three fundamentally distinct and characteristic groups:[1] those with normal basal metabolic rates (a normal heat production); those with increased rates, and those with decreased rates. The basal metabolic rate has, therefore, a greater fundamental significance[2] than simply as a test for hypothyroidism or hyperthyroidism although, as will be seen, a very high percentage of all abnormal basal metabolic rates are dependent on or accompanied by an altered function of the thyroid gland.[3]

Of the diseases thus far investigated, those characterized by an increased basal metabolic rate are exophthalmic goiter,[4] the hyperthyroidism of thyroid adenoma,[5] the active stage of acromegaly (hyperpituitarism), and all febrile conditions. In other diseases,[6] such as essential hypertension, pernicious anemia, leukemia, diabetes and possibly a very few not yet investigated, a basal metabolic rate slightly above normal may occasionally, though inconsistently, be encountered at various stages of the disease. In actual practice we have found that at least 95 per cent. of all abnormally increased basal metabolic rates are due to hyperthyroidism[7] (either that of exophthalmic goiter or of thyroid adenoma) if a febrile condition is eliminated by the thermometer.

A decreased basal metabolic rate is characteristic of myxedema,[8] and to a lesser degree, of hypopituitarism. There are other conditions, however, in which there is a decrease in the heat production, for example, those conditions which resemble the early stages of myxedema without the edema and which Plummer has tentatively grouped under the term secondary hypothyroidism, largely because they improve clinically as a result of thyroid administration. In this subgroup are cases of inanition from prolonged fasting or from restricted food intake, such as occurs in anorexia nervosa, in esophageal stricture or in cardiospasm; lastly, a few cases of decreased metabolic rate cannot be placed with any of the preceding groups and must remain unclassified for the present.

Finally, there is the very large number of diseases, not included in the foregoing groups, in which the basal metabolic rates are normal. Of these various conditions the most important from a diagnostic point of view is neurosis simulating hyperthyroidism. As a benign nontoxic adenomatous or colloid enlargement of the thyroid is often present incidentally in neurotic persons, it is sometimes impossible to eliminate the presence of a slight hyperthyroidism without the help of the basal metabolic rate.

For practical diagnosis, an increased basal metabolic rate indicates hyperthyroidism, either from exophthalmic goiter or thyroid adenoma, provided active acromegaly is ruled out and the group of febrile diseases is eliminated by a normal temperature curve. A knowledge of the temperature curve is necessary because an elevated basal metabolic rate usually occurs in conditions, such as mild tuberculosis, in which the evening temperature is slightly elevated, although at the time of the metabolism test the temperature may be normal. On the other hand, in hyperthyroidism, the temperature curve is normal, unless the patient has an intercurrent infection, such as tonsillitis, arthritis, endocarditis or tuberculosis. The basal metabolic rate is of the utmost value in the differential diagnosis of mild hyperthyroidism (of either type) and a neurosis simulating hyperthyroidism which often may be asso-

* From the Section on Clinical Metabolism, Mayo Clinic.

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5. Judd, E. S.: Results of Operations for Adenoma with Hyperthyroidism and Exophthalmic Goiter, Ann. Surg. **72**: 145-51 (Aug.) 1920. Mayo, C. H.: Adenoma with Hyperthyroidism, ibid. **72**: 134-141 (Aug.) 1920.

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7. McCaskey, G. W. (Footnote 2, second reference).

8. Boothby, W. M. (Footnote 1). Janney, N. W., and Henderson, H. E.: Concerning the Diagnosis and Treatment of Hypothyroidism, Arch. Int. Med. **26**: 297-318 (Sept.) 1920.

ciated with an enlarged colloid goiter or a thyroid adenoma which is not producing an excess of the thyroid hormone. In this type of case, even very slight technical errors must be eliminated, and therefore an exact method of determining the basal metabolic rate must be used and not one which merely gives an approximation of the true rate. Furthermore, particular pains must be used to prevent physiologic errors, because some neurotic persons are easily excited and may pass a sleepless night worrying about an unknown test that is to occur in the morning; other causes of a restless night, such as headache, backache, menstrual pains, slight indigestion or a mild cold (even without an elevated temperature), may cause the patient to be somewhat restless and uneasy during the test with a consequent slight elevation of the metabolic rate. Therefore, all patients having a rate ranging between + 10 and + 20 per cent. should have the test repeated on a subsequent day when disturbing factors are eliminated or at least greatly minimized. An increased metabolic rate in a neurotic patient is due to the fact that the rate was not obtained with the patient under basal or standard conditions. This point is emphasized to aid those who are beginning to use the basal metabolic rate as a diagnostic method; if the conditions for determining a true basal metabolic rate are not obtained or the method of determination is not carried out with the care necessary to eliminate even slight errors, one of the most valuable methods of diagnosis and classification of disease will fall into discredit from the discordant results obtained. It is only fair to say that the method is not suitable for the busy practitioner unless he is able to procure a properly trained technician who will have the time and means to carry out with exactness the fine details of technic requisite for obtaining a true basal metabolic rate; it is practical, however, for any small well equipped and carefully conducted clinical laboratory. For routine clinical work, we prefer the gasometer or open method [9] of indirect calorimetry to the closed circuit system.[10]

The basal metabolic rate is of the greatest help in the differentiation of recurring or persistent hyperthyroidism and the nervous or debilitated condition which occasionally follows thyroidectomy and in which it is important to know whether the thyroid is still overactive and causing thyroid intoxication. In this connection it must be remembered that the hyperthyroidism [11] of either exophthalmic goiter or thyroid adenoma presents waves of intensity alternating with periods of remission and occasionally even of intermission; in this irregularity, hyperthyroidism resembles certain febrile diseases, except that the time element in the former is weeks or months, instead of hours or days. Since the basal metabolic rate in thyroid disorders indicates the intensity of thyroid intoxication, it parallels the exacerbation or remission of the hyperthyroidism, so that a normal or nearly normal rate may be found in a patient who presents himself for examination during a period of thyroid remission and gives a more or less definite history of previous exacerbations of hyperthyroidism. On the other hand, the number of these cases is very small and does not include the large group of neurasthenics who give a positive epinephrin reaction,[12] but who have normal basal metabolic rates.[13] We have found no evidence that this group of neurasthenics with normal basal metabolic rates, although they may have some of the symptoms resembling those of mild hyperthyroidism, is dependent on variations in the physiologic activity of the thyroid gland as suggested by Goetsch.[3]

The value of the basal metabolic rate in following the course of hyperthyroidism and the effect on it of treatment is comparable to the temperature curve in febrile disorders, a variation in the basal metabolic rate indicating a parallel variation in the thyroid activity. Although the basal metabolic rate gives information of the degree of thyroid activity, it does not measure the patient's ability to withstand a superimposed stress, such as an operation; in other words, it does not tell us whether or not an operation is safe. We do know, however, that the higher the metabolic rate the greater is the stress to which the patient is being subjected and the greater is the consequent reduction in his reserve powers and the probability of the presence of serious organic damage; therefore, in a large series, the mortality in patients with high rates is greater than in patients with low rates. This is strikingly similar to the value of the temperature curve in febrile diseases, since, in pneumonia, for example, the patient with a temperature of 105 F. may quickly recover, while a patient with a temperature of 103 or even less may die, although on the average there is a higher mortality in the more severe pneumonias, their severity being determined by the temperature curve. Just as in the febrile diseases, the patients with a given temperature do not always present the same degree of reaction, as evidenced by the general clinical picture, so patients with the same basal metabolic rate may show different types of reaction; some are extremely sick, in crises, and with profound organic lesions, while others are obviously carrying the rate well. Nevertheless, the basal metabolic rate serves as a valuable criterion in deciding on the best type of operative procedure.[14] In general, the mortality rate is increased in the group of patients with high metabolic rates, and therefore the ability of the patient to withstand thyroidectomy as a primary operation must be considered carefully. As a general rule, preliminary ligations are less frequently indicated in patients with rates below + 50 per cent. and very rarely in patients with rates below + 40 per cent.

The basal metabolic rate is of great value in the diagnosis of myxedema and hypothyroidism, although it must be remembered that not all cases in which metabolic rates are decreased are due, at least primarily, to thyroid deficiency because low rates are found in hypopituitarism, in inanition and in a condition somewhat simulating these yet probably of different etiology. As yet, the value of the metabolic rate in cretinism is less positive because the normal standards of heat production for infants and children under 14 years of age have not yet been accurately determined.

In the treatment of myxedema, whether idiopathic or postoperative, the basal metabolic rate is also of the utmost value, because the therapeutic aim is to give intravenously or by mouth sufficient thyroxin or thyroid extract to bring the basal metabolic rate to

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11. Plummer, H. S.: The Function of the Thyroid, Normal and Abnormal, Tr. Assn. Am. Phys. **31**: 128-133, 1916.

12. Sandiford, Irene: The Effect of the Subcutaneous Injection of Adrenalin Chlorid on the Heat Production, Blood Pressure and Pulse Rate in Man, Am. J. Physiol. **51**: 407-422 (April) 1920.

13. Tompkins, E. H.; Sturgis, C. C. and Wearn, J. T.: The Effects of Epinephrin on the Basal Metabolism in Soldiers with "Irritable Heart" in Hyperthyroidism and in Normal Men, Arch. Int. Med. **24**: 269-283 (Sept.) 1919.

14. Sistrunk, W. E.: The Selection of Operation for Exophthalmic Goiter, J. A. M. A. **74**: 306-308 (Jan. 31) 1920.

normal and to maintain the patient at the normal level by an appropriate daily dosage. For this purpose, frequently repeated basal metabolic rates are essential until the daily dosage necessary for that patient has been established accurately; thereafter, intervals of months or even a year may elapse between observations.

As stated above, the basal metabolic rate divides diseases into three groups in the same general manner as the body temperature classifies diseases as febrile and afebrile. There is a further similarity between the basal metabolic rate and the temperature, because in neither is there an absolute and unvarying standard of normality. The clinician is accustomed to see, on his daily rounds, variations in the temperature curve between 97.5 and 99 F., to which he pays little or no attention. Changes in the body temperature within this range at different times of the day or on different days in the same patient affect but little the conception of the case, nor do these normal variations serve to subclassify the patients into different groups. In a similar way, basal metabolic rates between + 10 and — 10 have no pathologic significance, while variations beyond these limits have more and more significance, the greater the variation from normal. The range of temperature considered essentially "normal" is between 97.5 and 99.0 F., while the range of temperature between 99 and 105 F. or more indicates a febrile disease; there is thus a normal variation of 1.5 degrees to a pathologic variation of 6 degrees, or as 1 is to 4.7. The range of basal metabolic rates considered essentially "normal" is between — 10 and + 10 per cent., while the range of basal metabolic rates between — 10 and — 45 per cent. and between + 10 and + 125 per cent. or over indicates an abnormal heat production: a normal variation of 20 points to a pathologic variation of 150 points, or as 1 is to 7.5. It is obvious, therefore, that although the normal standard for the basal metabolic rate is not exact, yet its variability in normal persons compared to its pathologic variations is of a distinctly higher order of accuracy than that between the variations of "normal" and "febrile" temperature.

SUMMARY

1. The basal metabolic rate is a measurement of the heat production in a person under standard conditions.

2. Like the temperature, the metabolic rate is a measurement of certain heat phenomena inherent in the living organism.

3. The basal metabolic rate differentiates diseases into three fundamentally distinct groups: those with normal basal metabolic rates (a normal heat production); those with increased basal metabolic rates, and those with decreased basal metabolic rates.

4. The "normal" standard of the basal metabolic rate is not exact, yet the comparatively small "normal" variation, compared to the wide range of pathologic variation, admits of fully as accurate grouping of diseases as does the body temperature.

5. It is to be hoped that the value of basal metabolic rates will not be discredited by carelessness in technic and a failure to appreciate the necessity for carrying out all the technical and physiologic details requisite for obtaining accurate basal metabolic rates.[15]

15. In addition to the references already given, the following will be found of interest:
Benedict, F. G., and Collins, W. F.: A Clinical Apparatus for Measuring Basal Metabolism, Boston M. & S. J. **182**: 449-458, 1920.
Benedict, F. G., and Joslin, E. P.: A Study of Metabolism in Severe Diabetes, Pub. 176, Carnegie Inst. of Washington, 1912.
Du Bois, E. F.: Metabolism in Exophthalmic Goiter, Clinical Calorimetry, Paper XIV, Arch. Int. Med. **17**: 915-944 (June) 1916.
Harris, J. A., and Benedict, F. G.: A Biometric Study of Basal Metabolism in Man, Pub. 279, Carnegie Inst. of Washington, 1919.

BASAL METABOLISM DETERMINATIONS

TESTS WITH TWO PORTABLE CLOSED-CIRCUIT RESPIRATION APPARATUS

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There is much interest at present in the determination of the basal metabolism in various disorders, and its value in disturbance of function of the thyroid gland has been proved by numerous investigators. Heretofore, however, the usefulness of the basal metabolism determination has been greatly limited by the technical difficulties of the test, involving the use of a cumbersome, nonportable apparatus, or of the gasometer with the necessity for gas analysis—difficulties which place the test out of reach of the great majority of physicians.

Recently, Benedict [1] and, still more recently, Jones [2] each devised a portable apparatus for metabolism determinations. The basal metabolism determinations reported here were made for the purpose of determining the clinical reliability of these portable closed-circuit apparatus.

In the closed-circuit apparatus, the subject by means of a mask or mouth and nose piece rebreathes air from a closed system in which the carbon dioxid produced is absorbed by an alkali, and the oxygen consumed is measured. The closed-circuit apparatus is so named in contrast to the gasometer, in the use of which the subject breathes outdoor, or less preferably, room air, and by the use of a mask with suitable valves the expired air is collected and analyzed.

The Benedict portable respiration apparatus consists of a closed system including a spirometer into which is run a mixture of oxygen and air, and a bottle of soda lime, which absorbs the carbon dioxid produced, the gas mixture being circulated through the system by means of a fan driven by a small electric motor.

The Jones apparatus is a very portable closed-circuit system into which a known quantity of oxygen is introduced in liter quantities, and the time noted for the consumption of one or more liters of the gas. The carbon dioxid produced is absorbed by passing the expired gases over charcoal moistened with a solution of sodium hydroxid, ingeniously avoiding the use of a motor for circulating the air.

In Table 1 are the results obtained in twenty cases on various services at the Presbyterian Hospital. No attempt was made to select the subjects, and the results obtained are therefore those that may be expected in handling various types of patients. The subjects in all of the determinations went without food from 6 p. m. of the preceding day, with rest in bed the following morning, until the tests were made, between 8 and 10 o'clock. A determination and a duplicate determination were made on each patient with one apparatus and then with the other, making a series of four determinations on each patient. This became somewhat tiresome to very nervous patients who could not always be kept entirely quiet for the time necessary for the four tests, a factor that might change the metabolism rate a few per cent. The two apparatus were run alternately by the operators to avoid any personal factors in the use of either apparatus.

1. Benedict, F. G.: A Portable Respiration Apparatus for Clinical Use, Boston M. & S. J. **178**: 667 (May 16) 1918; Notes on the Use of the Portable Respiration Apparatus, ibid. **182**: 243 (March 4) 1920.
2. Jones, H. M.: A Simple Device for Measuring Basal Metabolism, J. A. M. A. **75**: 538 (Aug. 21) 1920.

In a study and summary of Table 1 it is noted that the greatest variation between check readings for the Benedict apparatus was 9 per cent., and for the Jones, 10 per cent. The average variation between the check readings for the Benedict was 3.5 per cent., and for the Jones, 3.7 per cent. For the last eight cases a modification of the technic in obtaining the beginning and end points in the Jones apparatus was instituted (through a personal communication from Dr. H. M. Jones) which materially reduced the chance for variations and errors in the readings, and for these eight cases the greatest variation on the Jones apparatus was then only 5 per cent., and the average variation, 2.4 per cent. The greatest variation between the average of the two determinations on the one apparatus and the average of the two determinations on the other was 9 per cent., the average difference being 3.9 per cent. It is also of interest to note that in using Du Bois' formula for obtaining the area of body surface, except for the four cases of thyrotoxicosis, only one other case (Case 9) was more than 10 per cent. above or below the normal rate. This patient was a greatly undernourished man, 6 feet 3 inches in height and weighing 151 pounds, with a basal metabolic rate of — 14 per cent.

The conclusion is justified, therefore, that the determinations by either apparatus, both in check readings against itself and against the other apparatus, are entirely satisfactory for clinical purposes. Because of its compactness, easy portability, relative simplicity of operation, and ease in calculation of results, the Jones apparatus is very suitable for clinical use. As a further test of its accuracy, the determinations shown in Tables 2 and 3 were made.

TABLE 2.—FIVE SUCCESSIVE DETERMINATIONS ON ONE PATIENT WITH JONES APPARATUS

Miss M. W.	1	2	3	4	5	Greatest Variation
C.c. of oxygen consumed per minute per square meter..	132	133	129	134	129	5 c.c.
Percentage of normal.....	103	104	101	104	101	4— %

In Table 2 are the results obtained in five successive determinations on one patient. The maximum variation in the five determinations is slightly less than 4 per cent. These results show a definite consistency throughout the series. The subject was given no preliminary training in breathing, and no special cooperation was asked.

Table 3 contains the results of readings made on a normal subject, an intern at the hospital. The test with a check determination was made each morning on first awakening for six successive days, except for an unavoidable intermission of one day between the third and fourth days.

TABLE 3.—DETERMINATIONS ON A NORMAL SUBJECT

Dr. P. M.	C.c. of Oxygen Consumed per. Sq. Meter per Minute		Percentage of Normal		Variations		
Date	First Reading	Second Reading	First Reading	Second Reading	C.c.	Per Cent.	Comment
9/22/20	132	135	97	99	3	2	Subject well awake
9/23/20	131	131	97	97	0	0	
9/24/20	123	125	91	92	2	1	Subject somewhat sleepy
9/26/20	131	129	97	95	2	2	
9/27/20	128	123	94	91	5	3	
9/28/20	129	132	95	97	3	2	
Average variation.....					2.5	2—	

These determinations yielded a greatest single variation between check readings of 3 per cent., with an average variation of less than 2 per cent. This subject had no preliminary tests, and no special cooperation as to regularity and amplitude of breathing was asked. These results suggest that with a trained breather as a subject this apparatus might be of much value, not only for clinical uses, but possibly for the more exacting results necessary in experimental nutrition and metabolism studies.

As a further test of the accuracy (as determined by securing suitable duplicate readings) of the apparatus, in cases with pathologic metabolic rates, five subjects with a clinical diagnosis of thyrotoxicosis were used, a 3 liter test being employed, followed in a few minutes by a similar determination. The results are summarized in Table 4.

These patients all had moderate or severe thyrotoxicosis; all were women, very nervous and restless. That the determinations could be made in such subjects without any great difficulty indicates that with proper precautions there is no serious discomfort to the patient which cannot be readily endured for the time necessary for the test. Case 32 was of special interest in that

TABLE 1.—DETERMINATIONS OF BASAL METABOLISM IN TWENTY CASES

Case No.	Name	Diagnosis	Percentage of Normal, Benedict Apparatus		Variation in Percentage Between the Two Readings	Percentage of Normal, Jones Apparatus		Variation in Percentage Between the Two Readings	Difference Between the Averages for Each Apparatus
			First Determination	Second Determination		First Determination	Second Determination		
1	Mrs. A. R.	Moderately severe thyrotoxicosis	133	135	2	158	162	4	6
2	Mr. F. C. D.	Duodenal ulcer	95	91	4	90	92	2	2
3	Mrs. A. F.	Irritable colon	106	103	3	100	110	10	4½
4	Mrs. P. A. K.	Tabes dorsalis	108	112	4	100	103	6	7
5	Mrs. L. M.	Duodenal ulcer	102	95	7	106	108	2	8½
6	Mr. H. G.	Neurasthenia	95	86	9	87	83	4	5½
7	Mr. R. M.	Carcinoma of stomach	95	102	7	98	101	3	1½
8	Mr. A. F.	Constipation	103	102	1	97	106	9	1
9	Mr. W. S.	Malnutrition	85	86	1	88	86	2	1½
10	Miss G. H.	Cholecystitis	104	107	3	103	101	2	3½
11	Miss S. F.	Severe thyrotoxicosis	157	160	3	158	150	8	4½
12	Mr. J. G.	Neurasthenia	104	99	5	96	101	5	3
13	Mr. J. L.	Duodenal ulcer	107	Pt. objected	..	109	Pt. objected	..	2
14	Mr. H. S.	Irritable colon	106	103	3	99	98	1	6
15	Mr. N. A.	Duodenal ulcer	99	102	3	98	99	1	2
16	Miss C. K.	Pseudohypertrophic muscular dystrophy	111	106	5	100	102	2	7½
17	Miss A. H.	Epilepsy	103	105	2	104	107	3	1½
18	Miss N. S.	Severe thyrotoxicosis	162	161	1	173	168	5	9
19	Mr. H. L.	Adolescent struma	103	103	0	101	100	1	2½
20	Miss E. P.	Mild thyrotoxicosis	123	120	3	120	121	1	1
	Greatest variation		...	...	9	...	...	10	9
	Average variation		...	...	3.5	..	...	3.7	3.9
	Average variation in last eight cases		...	...	..	...	...	2.4	

the thyrotoxicosis was associated with a marked myocardial weakness with cardiac decompensation. The patient had a marked edema and a definite dyspnea while lying quiet, yet she withstood the determinations without any special complaint. The greatest single variation in check readings was 8 per cent.; the average variation, 3 per cent. A more extended series of cases might show a slightly higher average variation between check readings, but the readings are entirely comparable for clinical purposes.

TABLE 4.—DETERMINATIONS ON PATIENTS WITH THYROTOXICOSIS

No.	Name	C.c. of Oxygen Consumed per Sq. Meter per Minute		Percentage of Normal		Variation in Percentage
		First	Second	First	Second	
31	Mrs. A. R.	198	195	156	158	2
32	Mrs. A. B.	182	180	154	153	1
33	Miss N. S.	216	219	164	166	2
34	Mrs. P. N.	167	170	136	138	2
35	Miss M. O.	200	211	155	163	8
	Average variation					3

TECHNICAL FACTORS

Since various factors influence the metabolism to a greater or less degree, it is best to adopt a certain routine procedure in making these determinations. The following regulations are suitable for clinical purposes:

1. The patient should be in the postabsorptive period, since the digestion of food definitely increases the heat production. To meet this condition the subject should abstain from all food, also tea and coffee, after 6 p. m. of the preceding day.

2. The patient should be in a state of muscular repose. This is secured by quiet rest of the patient in the recumbent or semirecumbent position for at least twenty minutes and preferably thirty minutes, before the test is begun. As the raised metabolic rate incident to severe muscular exercise persists over a period of several hours, the subject should go through as little muscular exertion as possible in the morning before being put at rest.

3. As the metabolism is raised by fever, the temperature of the patient should not be above normal. The subject should be comfortably warm.

4. Since there has been noted a probable variation in the metabolic rate, depending on whether it is taken while the subject is sleeping, on first awakening in the morning, or in the evening, it is desirable to make the determinations entirely in the morning.

5. The patient should be lying comfortably, either in a recumbent or semirecumbent position. With the patient sitting erect there may be a slight increase in the metabolic rate, probably due to increased muscular tension.

6. The accuracy of the test depends on the exclusion of any leak whatsoever in the circuit; therefore, the careful application of the nose piece and mouth piece cannot be too strongly emphasized. The mouth piece should be so inserted as to fit comfortably, with the lips well closed around the rubber margin. It is advisable to explain to the patient that there must be no leak at the angles of the mouth. This is most likely to occur during inspiration, but with ordinary care there is no danger of such a leak. A leak through the nose is more readily possible and may be unsuspected. Therefore, after the nose clip has been carefully applied, it should be tested for a possible leak by having the patient attempt to breathe in and out through the nose. After the conclusion of the test it should be similarly tested before the nose clip is removed. With moderate precautions, a leak will not occur.

7. The precautions given in the original description of the use of either apparatus must be carefully observed, and are relatively simple. Worthy of special mention are the changing of the alkali as directed, and also the testing of the apparatus daily for a leak.

8. Preferably, each determination should be from ten to fifteen minutes in length, as any error incidental to obtaining the beginning and end points is mathematically reduced the longer the duration of the test. A duplicate determination should be made in every case.

CONCLUSIONS

The results obtained in this series of cases show the suitable clinical accuracy of either of the two portable closed-circuit respiration apparatus. The Jones apparatus, the most recent addition to the methods now in use for determining basal metabolism, because of its compactness, relative simplicity and accuracy, is especially valuable for clinical use.

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LABORATORY PROBLEMS OF BLOOD TRANSFUSION *

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The laboratory problems of transfusion concern the transfer of whole blood from the circulatory system of one person to that of another. The discussion does not include the process of introducing blood beneath the skin and into the peritoneal cavity or the use of various fluids which have been suggested as temporary substitutes for blood. The operation of transfusion was utilized long before the circulation of the blood had been demonstrated. Nothing of scientific importance was suggested, however, until William Harvey announced his epochal discovery in 1628. Of great importance in the early investigations are the valuable experiments on animals of Richard Lower, in 1667. In the same year Denys published the favorable results which he had obtained by transfusing into man the blood from lambs and calves. The Faculty of Medicine of Paris discussed transfusion of blood, and in 1668 announced an edict forbidding transfusion except by special sanction of the faculty. In succeeding years, reports of animal and human experiments appeared; but it was not until 1818 that Blundell published the results of his experimental work. He found that it was possible by the use of a syringe to transfer blood from one animal to another, and he noted the remarkable results that are to be achieved by transfusion after severe hemorrhage. His experiments on transfusing the blood of one species into that of another were confusing, but he recorded the fact that beneficial results follow the introduction into an animal of a considerably smaller amount of blood than the animal has lost. Other investigators examined this problem with varying results, and in 1874 Hasse described the rigors, fever, suppression of urine or hematuria that follow the injection of the blood of an antagonistic species. Ponfick, in 1875, described the lesion of the kidney in fatal reactions. Previous to Hasse's work, Landois had shown that the serum of

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some animals possesses the property of dissolving that of other animals, and indicated the importance of this in transfusion. Hayem, in 1889, described the minute emboli and small infarcts that may follow unsuccessful transfusion.

As a result of this earlier work, it became apparent that the use of animal blood for injection into man is dangerous; that transfusion from man to man is usually a successful procedure; that relatively small amounts of blood are necessary; that the operation may be by direct anastomosis or by intermediation of instruments; that certain cases show reaction, and that fatal cases show embolism, multiple infarction of various organs, and severe tubular lesions of the kidney.

EFFECTS OF ANEMIA

The investigations of later years have concerned themselves in part with the explanation of results, be they good or bad. The clinical indications for transfusion appear to be problems rather of the clinic than of the laboratory, although much light may be thrown on this division of the subject in the future by correlated laboratory and clinical investigations. The experience with transfusion in the World War, in addition to a vast accumulation of evidence in civil practice, has shown the undoubted value of the operation following hemorrhage. Under favorable conditions a relatively small amount of blood will produce the most astounding results, and a patient may be transformed from a comatose, pulseless, moribund individual into a bright, slightly flushed, convalescing patient. There are probably several important influences brought to bear: one on the circulatory balance, one on the metabolism, and another on the production of erythrocytes.

In order to understand the influence of transfusion, it is important to know the exact effects of anemia. The influence of hemorrhage on circulation has been studied by Wiggers and others, and the clinical manifestations are well known. The fall in blood pressure, diminution in pulse pressure and, in severe hemorrhage, the signs of collapse are familiar observations. For a time the ventricular output is maintained, owing to increased contraction of the auricles; but finally the ventricular output is decreased. For a time this is partly compensated by increase in the heart rate. Cardiac nutrition is well maintained, and death is due rather to circulatory depression than to failure of the myocardium. Owing to the reduction of erythrocytes there is anoxemia, and as a result an increase of pulmonary ventilation. That this may wash out carbon dioxid from the blood is to be expected; but apparently this does not overcome the respiratory stimulus of the anoxemia. The beneficial influence of transfusion is immediate and marked, and a smaller bulk of blood is necessary for this result than is lost in the hemorrhage. Circulatory restoration is explained by the fact that the bulk of circulating fluid partly increased by the transfusion is further augmented by withdrawal of fluid from the tissues into the blood vessels; but no such logic satisfactorily explains the improved respiration.

The influence of anemia on metabolism has been studied with variable results. According to Hawk and Gies, as well as Haskins, hemorrhage leads to an increase of nitrogenous metabolism. Tomkins, Brittingham and Drinker have examined the literature carefully as concerns not only the acute anemias following hemorrhage but also the chronic forms, and they conclude that there is "a tendency toward increased metabolism in anemias of all types." This may be due to the increase in cardiac and respiratory rate, to the increased metabolism or young erythrocytes, to the activity of blood-forming centers, to undetermined toxic influences, or to some combination of these factors. These investigators found that in anemia, transfusion produces a decrease of metabolism to the normal. This, however, is followed after several days by a decrease in cardiac and respiratory rate, a drop of temperature in febrile cases, and an increase in hemoglobin and erythrocytes. Thus, the alteration in metabolism is not dependent on any of these factors, and Drinker and his associates suggest that in anemia the increased metabolism may be due to a general increase in stimulation of body cell activity. Harrop has recently studied the oxygen consumption of young erythrocytes, and finds that they consume more oxygen than do the adult cells; the examination of the blood cells of anemic patients, however, detected no notable difference in oxygen consumption from that of normal individuals.

It is well known that transfusion in acute anemias is followed by progressive increase in the number of erythrocytes and the percentage of hemoglobin. As was pointed out by Blundell, the benefits of transfusion are out of proportion to the amount of blood injected, and the question arises as to why this is so. Certainly a loss of blood provides a stimulus to the blood-forming centers. Otherwise, the anemia following hemorrhage would not be compensated. It is to be supposed, however, that in serious hemorrhage this stimulus may be so great as to be inhibitory, or the patient may die before the stimulus can be effective. Does transfusion as a simple measure operate to maintain the individual in the living state until the blood-forming centers can take up their great burden, or does transfusion itself operate as a stimulus? It appears from the investigations of Robertson that in animals with a normal blood content, an increase in total blood content is followed by a depression of blood formation. The index of bone marrow activity is found in the number of reticulated erythrocytes and in the number of blood platelets in the circulating blood; in experimental animals the bone marrow may be observed directly.

The work of Robertson, Lee, Minot and others indicates in a broad way that transfusion probably acts as a stimulus in acute anemias, but it is difficult to determine which is the more important factor, the stimulus of the anemia itself or that of the transfusion, and comparative studies must be made before this question can be answered. From Robertson's work it appears that a delicate balance is maintained between the number of circulating erythrocytes and the productivity of the blood-forming apparatus. As has been mentioned, plethora will reduce blood formation but, if maintained, the bone marrow appears to adjust itself to this condition so that a subsequent reduction of the blood to normal operates on the marrow as does an absolute anemia. Furthermore, continued plethora produced by multiple transfusions in some animals leads to such a depression of blood formation that anemia finally results. A point of considerable practical importance is the fact that patients with chronic anemia may be harmed more than they are helped by large transfusions, apparently because the bone marrow has adjusted itself to the small number of circulating erythrocytes, and the injection of a large bulk of blood may produce a serious depression of the already

relatively inactive marrow. In such cases, multiple small transfusions would probably be more desirable than a single large transfusion. The beneficial effects of transfusion in successful cases are therefore but imperfectly understood, and it seems probable that further study may result in modifications of the operation which may simplify it and render the benefits greater and more lasting.

CLASSIFICATION OF HUMAN BLOOD INTO FOUR GROUPS

The unfavorable results of transfusion vary from slight reactions on the part of the patient to more severe reactions, and in some cases death. Of considerable interest in this connection is the fact that some patients fail to show reaction until twelve or eighteen hours have elapsed. The cause of these reactions, even today, is not clearly understood. In spite of the fact that in the vast majority of cases the presence of isohemagglutinins and isohemolysins explains unfavorable results, this is not true of all cases. It has generally been accepted that these two normal immune bodies act interdependently; but recent work by Kolmer appears to indicate that agglutination and hemolysis in this relation are not necessarily interdependent. In our discussion it seems desirable from the standpoint of simplicity to consider these bodies as operating interdependently, and then discuss the possible exceptions to this rule. Isohemagglutinins were discovered independently in 1900 by Landsteiner and by Shattock. Landsteiner classified human blood in three groups, depending on the power of serum to agglutinate the corpuscles. This was confirmed by numerous other

TABLE 1.—REACTION OF SERUM AND CORPUSCLES

Group I.	Serum agglutinates cells of Groups II, III and IV. Cells agglutinated by no serums.
Group II.	Serum agglutinates cells of Groups III and IV. Cells agglutinated by serums of Groups I and III.
Group III.	Serum agglutinates cells of Groups II and IV. Cells agglutinated by serums of Groups I and II.
Group IV.	Serum agglutinates no cells. Cells agglutinated by serums of Groups I, II and III.

workers until Hektoen, in 1907, found that this classification did not satisfy the hemagglutinative activities of all human bloods. Jansky, in 1907, and Moss in 1910, independently discovered that there are in reality four groups. Unfortunately, these workers published

TABLE 2.—JANSKY CLASSIFICATION

Cells	Serum I	II	III	IV
I	—	—	—	—
II	+	—	+	—
III	+	+	+	—
IV	+	+	+	—

their classifications in such a fashion that the numbers designating the groups were transposed, and this has led to considerable confusion. Much of the work that has appeared recently has been based on the Moss classification; since Jansky's work appeared three years earlier, however, and was recognized by Hektoen, Ottenberg and others in important publications, I have adopted the classifications proposed by Jansky. Accordingly, Table 1 represents the reaction of serum and corpuscles of the four groups.

This may be tabulated as in Table 2.

As the Moss classification has in the past been widely adopted, it may be well to show also the grouping on that basis (Table 3).

The incidence of the groups in man has been studied by numerous investigators, and the exact figures have been found to vary somewhat. Nevertheless, Groups I and III predominate, and collectively constitute about four fifths of the race. In spite of the large number

TABLE 3.—MOSS CLASSIFICATION

Cells	Serum I	II	III	IV
I	—	+	+	+
II	—	—	+	+
III	—	+	—	+
IV	—	—	—	—

of tests made, the factor of "random sampling" determines a certain amount of error. On the basis of more than 5,000 tests made by five different investigators, the average incidence, according to the Jansky classification, is that given in Table 4.

TABLE 4.—INCIDENCE OF THE FOUR GROUPS IN MAN

	Per Cent.
Group I	42.84
Group II	10.36
Group III	41.38
Group IV	5.42

The development of these isohemagglutinins has recently been investigated by Happ in 131 individuals from birth to 10½ years of age. He finds that the group characters are established in the corpuscles before they are established in the serum, and that this early acquisition of character in the corpuscles is subject to change until the group of the serum has been established, after which there is no change. Although agglutinins are present in mother's milk identical with those of her blood, they are not transmitted through the milk to the infant, because bottle-fed babies appear to develop iso-agglutinins in the same fashion as breast-fed babies. Von Dungern and Hirschfeld demonstrated that the inheritance of blood groups follows the law of Mendel. So far as has been determined, no very definite physical characters of the blood are associated with the presence or absence of group agglutinins.

AGGLUTINATION

Landsteiner explained the occurrence of interagglutinability of blood on the basis of the Ehrlich hypothesis. His hypothesis is similar to that proposed for the three groups by Hektoen. Landsteiner expressed the belief that human bloods as a class contain two agglutinins, A and B, which are variously distributed in the serums of the four different groups. Similarly, two receptors or agglutinogens for these agglutinins are supposed to be distributed among the corpuscles of the four groups. A serum which agglutinates no corpuscles contains neither agglutinin A nor agglutinin B, whereas a serum which agglutinates the corpuscles of all other groups contains both agglutinins A and B. Conversely, corpuscles that are not agglutinated by any serum contain no receptors or agglutinogens, and corpuscles that are agglutinated by the serums of all other groups contain receptors a and b. The distribution of these agglutinins and agglutinogens is made somewhat clearer by Table 5.

Thus, the serum of Group I, which agglutinates the corpuscles of the other three groups, contains both agglutinins A and B; and the serum of Group IV, which does not agglutinate any corpuscles, contains no

agglutinins. The cells of Group I, which are not agglutinable, contain no receptors; and the cells of Group IV, which are agglutinated by the serums of the three other groups, contain both receptors a and b. Since the cells of Groups II, III and IV contain either or both receptors, these cells can be operated on by the serums of Group I, which contains agglutinins for both receptors. Serum of Group II contains agglutinin A, and therefore this serum can agglutinate the cells of Group III and Group IV, both of which contain receptor a, suitable to the activity of agglutinin A. The serum of Group III contains agglutinin B, and therefore can agglutinate the cells of Groups II and IV, both of which contain receptor or agglutinogen b.

Numerous experiments have been performed in connection with the Landsteiner hypothesis, the most recent being those of Koeckert, who has applied the phenomenon of differential absorption to the hypothesis. As an example of this method, it is possible to absorb from the serum of Group I, which contains agglutinins A and B, either of the agglutinins. If it is desired to absorb agglutinin A, the serum is mixed with the corpuscles of Group III, and after proper exposure the cells are removed by centrifugalization. Subsequently, this serum does not show the characters of the serum of Group I, but exhibits those of Group III, and instead of agglutinating Groups II, III and IV, it will agglutinate only corpuscles of Groups II and IV. By reference to the table it can be seen that the serum has therefore taken on the character of a Group III serum rather than a Group I serum.

TABLE 5.—DISTRIBUTION OF AGGLUTININS AND AGGLUTINOGENS

	Agglutinin (Serum)		Agglutinogen (Cells)	
Group I	A	B	—	—
Group II	A	—	—	b
Group III	—	B	a	—
Group IV	—	—	a	b

The same principle is applied to the serum of the other groups, and the hypothesis of Landsteiner supported. Karsner and Koeckert, however, have shown that desiccation of human serum leads not only to deterioration of the agglutinins, but after a time the serums acquire the power of nonspecific agglutination so that each of the serums can agglutinate the cells of all the groups. Karsner and Collins have pointed out the fact that during desiccation the buffer value of the serum changes with an increase in hydrogen-ion concentration, and it seems probable that other physical chemical changes may occur. Gay was of the opinion that the interagglutinability of human blood is governed by physicochemical laws. For the present, it may be said that the Hektoen-Landsteiner hypothesis offers an excellent working basis for the explanation of the phenomenon; but it seems possible that the further investigation of the problems of immunity on the basis of the laws of colloidal reactions and those of physical chemistry may offer a more satisfactory explanation.

It would be expected that if interagglutination appears in the test tube, transfusion with such bloods would always result unfavorably; but as a matter of practical experience, it has been noted that individuals of Group I may serve as donors for that group or any other group. In other words, it appears to be safe to transfuse the blood of a donor whose serum in vitro agglutinates the recipient's corpuscles. Conversely, it is dangerous to inject a blood whose corpuscles are agglutinated by the recipient's serum. Group I cells are not agglutinable, and it is considered possible, therefore, to regard individuals of this group as "universal donors." In my experience, very rare reactions have resulted from following this rule; but for all practical purposes it appears to be reasonably safe. The report of the Interallied Surgical Congress [1] states that fatal accidents have been observed in some cases in which the cells of the donor are agglutinated by the plasma of the recipient, but that these grave accidents are rare. If a choice is possible, the safety of the operation is probably somewhat enhanced by the use of a donor from the same group as that of the recipient. The explanation of the usefulness of Group I as a universal donor presents one of the most interesting of the laboratory problems. In this connection it must be remembered that a small bulk of blood is introduced in proportion to the bulk of blood in the recipient's body, even though he may be severely anemic.

The agglutinating power of human serum is never strong as compared with the potency of artificially prepared immune serums; hence the dilution of the blood of the donor as it enters the circulation of the recipient may be sufficient to nullify the action of the agglutinin contained in the donor's serum. The titer of human agglutinins is usually 1:16 to 1:32. The bulk of blood injected in the course of transfusion is from 500 to 1,000 c.c., of which approximately one half is plasma. Thus, between 250 and 500 c.c. of plasma is introduced into the circulation, which even after severe hemorrhage contains sufficient fluid to dilute this bulk ten or more times. If, however, the agglutinin titer of the donor's serum is unusually strong, the dilution may not be sufficient to protect the recipient, and this may possibly explain the occasional accidents following the use of a donor whose serum agglutinates in a test tube the corpuscles of the recipient. It has been suggested that the protection of patients against the agglutination of serum may be due to the presence in the blood of weak antiagglutinins; but in a large series of experiments, Koeckert and I have failed to demonstrate any such protective substance. Another explanation offered for the protection of the recipient is that agglutinin in the donor's serum is distributed through such a large bulk of corpuscles that it cannot operate to clump these cells. In other words, when the serum is introduced, each corpuscle of the many millions in circulation takes up an equal share of the agglutinin, so that the amount absorbed by each corpuscle is too small to result in agglutination. Even were there some irregularity in the absorption by individual corpuscles and small clumps of agglutinated cells formed, these would probably be of such small size as to be of no significance.

The influence of agglutination is emphasized rather than that of hemolysis because it seems unlikely that the amount of hemoglobin produced in the course of hemolysis would operate deleteriously. Naturally, if the cells that are introduced are hemolyzed, they probably do no good; and conversely, if the patient's cells are hemolyzed, the operation may do harm in that it may reduce the number and quality of the patient's corpuscles. It might be supposed that if the introduction of cells has a definite effect on bone marrow, hemoglobin may have the same effect; but Robertson has shown that hemoglobin does not stimulate the bone marrow. On the basis of earlier studies, it has

1. Presse méd. 26: 193, 1918.

been accepted that the agglutinin and the hemolysin in a serum operate in sequence; that the two bodies are interdependent and, so far as practical purposes are concerned, essentially the same. Kolmer has recently studied this matter, and finds that human serum taken as a class contains two agglutinins and two hemolysins which are separable by heat; and he further shows that hemolysis is not necessarily preceded by agglutination, as has previously been believed. This being the case, it might seem advisable to test the blood for the presence of hemolysins as well as for the presence of hemagglutinins. It hardly seems necessary, however, to recommend the routine examination of blood for the presence of hemolysins because of the fact that hemolysis apparently does little if any harm. If it occurs, however, the transfusion is useless and it cannot be stated with certainty that it is entirely harmless. Boidin recently reported a case in which extremely severe shock and hemolysis occurred in a transfusion with perfectly matched bloods. An analysis of the case appears to indicate that the hemolysis was of only secondary importance and that the reaction was of the nature of protein shock. Bordet finds that corpuscles saturated with antibodies are toxic for guinea-pigs, and classifies the toxic material as anaphylatoxin. Karsner and Aub found that injection of agglutinating and hemolytic serum into cats leads to a necrosis of the liver, more extensive than can be explained by the mere blocking of the liver sinusoids and therefore probably due to some toxic body. Although by no means proved, it seems possible that even though hemolysis itself does no harm there may be formed in the process a toxic substance that can lead to serious disturbance.

TESTING BLOOD FOR COMPATIBILITY

Experience has shown that the use of blood for transfusion which has been properly tested and grouped removes much of the danger of the operation. Occasional reactions, however, are noted, some of which appear immediately and some of which are delayed for several hours. Before commenting further on the reason for reactions with tested bloods in transfusion, it is well to discuss the preliminary tests. Formerly, the blood of the patient was treated against the bloods of several prospective donors to determine both agglutination and hemolysis; but the more recent methods save time by considering only the agglutinative activity. The method pursued in testing depends in large part on whether or not a laboratory possesses standard serums. If these are not to be had, the agglutinability of the patient's blood against that of the donor's may best be determined by the methods described by Rous and Turner. This method utilizes small quantities of plasma and corpuscles, and determines the reaction with two different strengths of plasma. The method is accurate and rapid. If standard serums are available, it is customary to determine the group of the patient and of the donor by ascertaining how the corpuscles of these bloods react to standard I and II serums. For this purpose the blood to be examined is collected by allowing a drop of blood obtained from a pin prick to flow into about 0.5 c.c. of salt solution in a small test tube. The suspension is slightly opaque, and if clotting occurs, the corpuscles may be satisfactorily resuspended by vigorous shaking. On a microscope slide are placed a drop of serum II and a drop of serum III, into each of which is emulsified a drop of the corpuscle suspension by means of a platinum loop. Agglutination occurs usually within five or ten minutes, but may be delayed as much as half an hour. The result may be observed with the microscope, a 16 mm. lens being used, or by means of a hand lens with a magnification of 6 to 10 diameters. The clumps are usually visible to the naked eye, but it is considered safer to make the observation by means of magnification. We find the result somewhat more simple to observe if the slide is inverted after the mixture has been made and the drops observed as hanging drops. If no agglutination occurs, the cells belong to Group I. If agglutination occurs in both drops, they belong to Group IV. If agglutination occurs in serum III and not in serum II, the cells are those of Group II, and if the converse is true the cells are of Group III. Controls may be instituted by the use in addition of a Group IV serum or by the use of corpuscles of Group I. Table 6 illustrates the identification of the group (Jansky's classification).

TABLE 6.—DETERMINATION OF GROUP

Cells	II	III
I	—	—
II	—	+
III	+	—
IV	+	+

As has been stated, it is of the utmost importance to determine that the serum of the recipient shall not agglutinate the cells of the donor. In fact, this seems to be the one important reaction to avoid. Accordingly, it has been suggested that a drop of the recipient's serum may be mixed on a slide with a drop of the prospective donor's corpuscles. If no reaction appears, the transfusion may be proceeded with. I have seen two serious reactions accompanying transfusions made on the basis of this method. The patients were affected with chronic anemia and it was subsequently found that the agglutinin titer of their serums was so extremely low as not to produce agglutination on the slide; nevertheless, their cells were agglutinated by standard serums and were found to belong to groups antagonistic to those of the donors. The method, then, is subject to error if the agglutinative titer of the patients' serums is low. By the use of standard serums this error is avoided because corpuscles exhibit little difference in agglutinability, and the standard serums are selected because of comparatively high agglutinin titer.

In connection with testing by the use of standard serums, the question of preservation of serums over a long period of time has been examined. Sanford maintains that the serums may be dried on perfectly clean slides wrapped in paper, kept in the refrigerator, and thereby satisfactorily preserved. Hartman has suggested the use of serums dried on filter paper. I attempted preservation by drying in air in the moist climate of France, and found that deterioration resulted in the course of five or six days. This question has been investigated by Karsner and Koeckert, who found that desiccation results in definite deterioration in from two to three weeks, and that an entire loss of group specificity appears in from three to five weeks. Kolmer and Trist have confirmed the loss of group specificity, and suggest that a preservative (0.2 per cent. tricresol) added before desiccation leads to better preservation. In our hands, preservation with 0.5 per cent. phenol (carbolic acid) made no difference in the loss of specificity. I have pointed out the value

of preserving the serums for individual tests in drawn out glass tubes similar to those used for vaccine virus. The addition of 0.5 per cent, phenol or 0.2 per cent. tricresol is recommended if absolute sterility is not obtainable. By this method serums retain their agglutinating strength for periods of more than three months.

A method of this sort obviates the necessity for opening a large ampule each time a test is performed. Were it possible to prepare in animals immune serums specific for each of the four groups, considerable amounts of high titer serums could be collected and used for testing. Kolmer and Trist attempted to immunize sets of animals by repeated injections into each set of animals of blood cells from each of the four groups. The resulting serums were highly agglutinative for human blood as a class, and in a few instances the agglutinins were present in slightly higher titer against the group cell used for injection than against cells of the other groups. The difference was slight, and absorption of agglutinin by means of the cells of any group removed agglutinins for all the groups. The factors which determine the distribution of groups in man are not of sufficient prominence to produce specific results following animal inoculations. This is in conformity with the general rule that the specificity of artificial immunity has to do with a species as a whole rather than with a group of individuals, a single individual or an organ or tissue.

It has been of interest to calculate the favorable chances of transfusion in case blood is not tested. On the basis of figures similar to those given above for the incidence of groups, I estimated that 64.9 per cent. approximates the chance of favorable results. Dr. W. B. Rogers, in a field hospital in France, was obliged to perform a considerable number of transfusions with untested blood. In thirty-six of his cases, which could be used for determining presence or absence of reactions, 73 per cent. showed no reaction. Crile has summarized the results of transfusion previous to the time of testing the blood, and quotes Jennings as showing that 39.1 per cent. failed to be benefited in one series of figures, and 34.5 per cent. in other series. These correspond closely to the theoretical figures estimated above.

Experience in the World War made it seem apparent to some of the operators that soldiers who received transfusions in the advanced hospitals, before testing had been established, showed fewer reactions than those who were transfused at the base hospitals. Patients at the base hospitals who required transfusion were frequently the victims of long-standing suppuration. The question naturally arose then as to whether or not the presence of disease influences the amount of agglutinin present in the recipient's serum. I have not been able to investigate this question in any detail, but the examination of the serum of a few cases of pernicious anemia shows that the titer of the agglutinin in their serums has been extremely low. It is too early to make any definite statement in this connection.

In regard to the compatibility of bloods, it is of interest to note the attempts that have been made to preserve blood corpuscles for subsequent use in transfusion. Undoubtedly, the animal body can replace the loss of fluid with considerable rapidity; and therefore, in the case at least of acute hemorrhage, the important element of success lies in the corpuscles. Two outstanding methods for preservation have been described. The older of these is the use of formaldehyd for preservation; this has been used by Burmeister for transfusion in cases of poisoning by illuminating gas. More recently, Rous and Turner have described a method that utilizes blood, sodium citrate, saccharose and water. Experimentally, they found that cells could be preserved for fourteen days and still be used. Robertson utilized a similar method for preservation of corpuscles for transfusion in France, and obtained excellent results.

Undoubtedly, the testing of blood for agglutination has placed the operation of transfusion in a much more satisfactory position than was previously the case. Nevertheless, even with the most careful matching of bloods, reports occasionally appear in which reactions of variable severity have been noted. It would seem, therefore, that in certain instances there are elements other than hemagglutination and hemolysis which lead to reaction. At the present time it seems that these elements may be discussed in three categories, namely: the foreign character of blood and protein; the influence of clotting, and the influence of anticoagulants.

It is well known that the injection of foreign protein into an animal may lead to reactions of greater or less severity, and that there is considerable individual variation within any given species. In certain instances, as for example the injection of eel serum into guinea-pigs, fatal reactions may follow the introduction of extremely small amounts of the foreign protein. It is rare, however, that any individual shows reaction to a native protein from another individual of the same species; but such a possibility cannot be entirely excluded. In other words, it is to be considered possible that the protein of one man may be toxic for another man. Such a reaction would be considered an evidence of natural hypersensitiveness. Reports have appeared which indicate that the use of a blood for transfusion may artificially render the patient hypersensitive to a subsequent transfusion, thus presenting the picture of artificially induced anaphylaxis. Such a type of anaphylaxis, however, has never been observed in the case of other animals, and most students of the subject consider that anaphylaxis within a species has yet to be demonstrated. It may be that the primary transfusion produces an immune body which, on interaction with the cells introduced in a subsequent injection, leads to the production of toxic products. This, however, is not the reaction of anaphylaxis according to a strict and narrow definition. Hanzlik and I have referred to this sort of phenomenon as anaphylactoid, and the term "colloid crisis" may also be applied. Ignorance of the variations in colloid constitution of protein solutions within the species prevents further hypothesis along this line; but it may be that future investigation will provide detailed information.

METHODS OF TRANSFUSION

The older method of transfusion, whereby blood vessels of one individual were directly anastomosed with those of another, was found to be objectionable because of the difficulty of measuring the amount of blood transfused. Accordingly, there have been developed numerous methods whereby the blood is transferred from one to another by the mediation of some instrument. Clotting of the blood is to be regarded as a process which begins to act as soon as the blood is outside the vessel. Even the use of anticoagulants does not entirely or immediately inhibit the process. The possibility that toxic materials can be produced even before the clot has formed has been recognized

by Satterlee and Hooker, by Minot and Lee, and by Robertson, and is indicated by the studies of DeKruif and of Janeway, Richardson and Park. What these toxic bodies may be is still problematic. For a variety of practical reasons it has seemed desirable to use anticoagulants during the period that the blood is out of the body; and of these, sodium citrate appears to offer the smallest possibility of danger to the recipient. Nevertheless, even under the most carefully controlled conditions, it appears that the use of citrated blood leads to a greater percentage of reaction than does careful transfusion by other methods. Drinker and Brittingham have studied the influence of sodium citrate and find that the reaction bears no constant relation to the method of citration or to the particular sample of citrate employed. They have noted, further, that the citrated plasma is not toxic but that the cells, even though thoroughly washed, are toxic even if injected into the individual from whom they were taken. Apparently the removal of the platelets and leukocytes by defibrination reduces the toxicity of the cell mass; but this toxicity is increased by the subsequent addition of citrate. It is possible, then, that the action of citrate on the cells may have a toxic influence or that, by failing to remove the platelets and the leukocytes, the toxic influence of these is not removed. They conclude that "while the totals of the different types of transfusions which have been employed are not large, it appears that three elements make up the final total of reaction in citrate transfusion: (*a*) very rare gross incompatibilities which escape in vitro detection; (*b*) changes in the plates, part of the process of coagulation; (*c*) direct action of the sodium citrate on red cells promoting hemolysis."

It is always recommended that a Wassermann test be performed on the blood of the donor in order to avoid the transfer of syphilis. There is, however, considerable difference of opinion among investigators as to the number of spirochetes in the circulating blood in latent syphilis. Certainly in the florid stages of syphilis this is a danger that must be seriously considered; but if the disease is so latent as to give no clinical signs, and if the necessity for transfusion is urgent, the failure to have a negative Wassermann test on the donor's blood should not prevent the operation. It seems unlikely that the disease will be transferred from a patient who gives no clinical evidence of being a victim. Levaditi and Marie have recently recovered the organism from a case of syphilis of fifteen years' duration. Graves found it in the blood of two tabetics. It is unlikely that such cases are encountered frequently. The danger, however, is real, and may be disregarded only under the most urgent circumstances.

A transfer of other septicemias is virtually out of the question because victims of this type of disease are obviously ill and are not selected as donors. Certain reports have appeared favoring the use of transfusions for patients suffering with chronic infections of pyogenic nature, and it has further been advised that in these cases the use of the blood of donors who have been immunized against the infecting organism would be of value. Transfusion on this basis would introduce into the patient corpuscles to combat the anemia and plasma endowed with immune substances to combat the organism causing the disease. There is at the present time no large amount of clinical observation to support this claim. If immunity can be transferred in this fashion, is it possible that natural hypersusceptibility, such as is indicated in hay-fever, asthma, eczema and similar conditions, can be transferred by transfusion? Ramirez has reported the case of a person who became hypersensitive to horse protein after having received the blood of a donor who was naturally susceptible to horse protein. This single instance illustrates the fact that the possibility of transfer of natural hypersensitiveness is not to be entirely neglected.

We may conclude that the study of isohemaglutination and isohemolysis has done much toward making the operation of transfusion relatively safe; but the problem of reaction is by no means completely solved. Extensive and intensive study of immunologic problems from the point of view not simply of immune substances as we understand them today, but from the broader view of physical chemistry, are necessary before we can place the operation on a thoroughly satisfactory basis.

EXARTICULATION OF THE HIP JOINT

WITH PRELIMINARY LIGATION OF THE COMMON ILIAC ARTERY *

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Amputation through the hip joint is generally considered a formidable operation associated with a high rate of operative mortality. The greatest difficulty encountered in the operative procedure is the control of hemorrhage.

Various methods for the control of bleeding during hip joint exarticulation, such as Senn's clamp, Wyeth's pins, and compression of the abdominal aorta, are described in the various surgical textbooks. The disadvantage of any tourniquet method is that the tourniquet is inconvenient and insecure during the operation if an attempt is made to amputate the soft parts very near the pelvic girdle. The disadvantages of relying on compression of the abdominal aorta for the control of hemorrhage is obvious.

McBurney [1] reported three successful cases of hip joint amputations in which the common iliac artery was temporarily compressed during the period of division and ligation of the vessels in the amputation wound. The compression of the artery was made by an assistant's fingers introduced through an abdominal incision. This method of control of hemorrhage during hip joint exarticulation has been used successfully by other operator's since McBurney's report.

Halsted [2] reviews thirty instances in which the common iliac artery has been permanently occluded without amputation of the extremity, and he states that uncomplicated permanent ligation of the common iliac artery is not likely to be followed by gangrene of the extremity.

It would seem, therefore, that if permanent ligation of the common iliac artery was not likely to produce gangrene in the entire extremity, it might be permanently ligated preliminary to hip joint exarticulation without fear of gangrene in the amputation flaps. That permanent occlusion of the artery would make the operation of amputation much easier and less bloody than temporary occlusion is obvious. The following is a brief abstract of a case in which this operative procedure was carried out.

* From the Department of Surgery, Washington University School of Medicine.

1. McBurney: Ann. Surg. **25**: 610, 1897.
2. Halsted: Bull. Johns Hopkins Hosp. **23**: 191, 1912.

REPORT OF CASE

History.—A widower, aged 54, laborer, admitted to Barnes Hospital, June 1, 1920, and discharged, July 25, whose family and past history were unimportant with relation to the present illness, was making his way through a barbed wire fence, Feb. 14, 1920, when his foot slipped and he fell. The family physician diagnosed the injury as a fracture of the femur, and treated the patient by the application of splints. Three weeks previous to admission the patient consulted another physician, who had roentgenograms made, which showed extensive destruction of the shaft of the femur. The patient was then referred to the Barnes Hospital by Dr. Marsden of Jerseyville, Ill.

On admission the patient was poorly nourished, and seemed much older than the age given. The left thigh was tremendously swollen. The skin was shiny and tense. On palpation there was a sensation of deep fluctuation. There was no union of the fractured femur. Very little tenderness and little pain was felt on movement of the extremity. A roentgenogram revealed extensive destruction of the middle third of the shaft of the femur. The temperature was 101, the pulse, 120. The white blood cells numbered 11,600.

The diagnosis made was osteomyelitis or neoplasm. An exploratory incision was made into the thigh, and uncontrollable hemorrhage was encountered. A tourniquet was applied and a midthigh amputation performed. During this operation the patient's pulse rate rose to 160, and his general condition became alarmingly grave. It was clear that the amputation was made through tumor tissue. The patient recovered from the operation slowly. Microscopic examination of the tumor identified it as a spindle cell sarcoma.

June 28, twenty-six days after the midthigh amputation, a transfusion of 550 c.c. of citrated blood was administered, following which the patient's hemoglobin rose from 50 to 65 per cent. and there was very marked improvement in his general condition.

July 2, the patient was made aware of the incomplete removal of the malignant tumor of the thigh, and hip joint exarticulation was advised with the idea in mind of saving him, if possible, from the experience of an ulcerating sarcoma of the thigh stump.

Operation and Result.—An abdominal incision was made at the medial border of the left rectus at the level of the umbilicus. The left common iliac artery was easily exposed through a small incision in the posterior peritoneum, and was tied tightly with a double strand of braided silk. The ligature was placed half-way between the bifurcation of the aorta and the origin of the hypogastric artery. The abdomen was closed.

The stump of the thigh was flexed and abducted. The anterior and posterior flaps of the skin were cut. The femoral artery and vein were isolated, clamped, divided and tied. The incision was carried through all the soft tissue down to the neck of the femur. The capsule of the hip joint was incised. The head of the femur was exarticulated. In cutting through the soft parts we observed bleeding from the sacral and obturator arteries. The bleeding was with some considerable force. The blood was bright red. The streams did not pulsate. All soft tissues bled, but no more than half a dozen hemostats were applied, as the bleeding everywhere, except from the largest arteries, quickly ceased.

The amputation wound was closed with the exception of a small cigaret drain at the lateral end of the closure. The patient's general condition was not noticeably changed during the course of the entire operative procedure. The pulse rate remained constantly at 120, which was the rate at the time of the abdominal incision.

The postoperative course was uneventful. The drain was removed from the amputation wound in forty-eight hours. There was very little drainage from the wound. The flaps healed by first intention, and there was no discoloration of the skin.

COMMENT

The operative procedure carried out in this case has been previously used by Trendelenburg[3] in one instance, and by Schonborn[4] in three hip joint exarticulations. In one of Schonborn's cases there was a small area of necrosis of the skin along the margin of one of the amputation flaps.

Preliminary ligation of the common iliac artery has been practiced by Jaboulay[5] and others for the control of hemorrhage during interilio-abdominal amputation.

In the instance reported in this paper, preliminary ligature of the common iliac artery resulted in the easy performance of a high hip joint amputation with little loss of blood. The patient's general condition was not disturbed by the operation, and the anemia of the tissue was not severe enough to influence the kindly healing of the operation wound.

The bleeding from the tissues divided in the amputation was of particular interest. Unfortunately, bleeding from the femoral artery was not observed, as this vessel was ligated before it was divided. Popert,[6] however, in reporting a case in which he had ligated the common iliac artery and divided the vessel distal to the ligature, states that the distal stump of the vessel bled. The sacral and obturator arteries in our case bleed freely. The streams of blood had considerable force, although there was no visible pulsation in the streams for the brief time they were observed. The tissues everywhere bled, but the bleeding so quickly ceased that hemostats were necessary in only a few instances. The fact that active bleeding from the larger arteries was observed is of interest in connection with McBurney's statement that compression of the common iliac artery resulted in complete absence of blood current beyond the point of compression, and Halsted's conclusion that permanent uncomplicated ligature of the common iliac artery is not likely to be followed by gangrene of the extremity.

In this instance it was certain that the complete occlusion of the common iliac artery did not completely arrest the blood stream in the sacral and obturator arteries. It is, of course, idle to speculate on the question of the efficiency of the amount of blood current present to preserve the vitality of the entire lower extremity had it not been removed. From some experimental work now in progress it has been astonishing to find how little blood stream to an extremity may be sufficient to preserve its complete vitality.

It may be stated that hip joint amputation in this instance was performed more with the object of saving the patient from the experience of an ulcerating tumor of the thigh stump than of curing him of the malignant tumor. But if preliminary ligature of the common iliac artery always resulted in the diminution of the blood stream, as in this instance, it might be possible to make amputations much more complete without serious operative risk. This point is worth consideration since malignant tumors of the sort found in this instance are likely to extend throughout the entire length of each muscle invaded. It would seem, therefore, that with such a tumor of the thigh there would be a better chance of complete removal of the tumor if especially those muscles which are invaded by the neoplasm were removed in toto. For example, in this instance, nodules of tumor were found in the adductor muscles near the level at which they were divided. And could it have been foreseen that the operation of amputation was to be so free from hemorrhage and shock, I feel sure that this patient's chances of free-

3. Trendelenburg: Arch. f. klin. Chir., 1881.

4. Schonborn, cited by von Berckel: Ueber neue Methoden der Exartikulations im Hufgelenk, dissertation, 1884.

5. Jaboulay, cited by Gayet: Province médicale, 1895.

6. Popert: Deutsch. med. Wchnschr., 1889, No. 29.

dom from recurrence of the tumor would have been greatly improved, and the danger of operation mortality not materially increased, if these muscles had been removed *en bloc* from their points of origin on the pelvic girdle.

At present, four months after operation, the patient weighs 25 pounds more than at the time of the fracture of his thigh, and shows no evidence of recurrence of the disease.

Another point worthy of mention is that in the case reported in this paper, the hip joint exarticulation was a reamputation thirty days after a midthigh amputation. Cooper,[7] in referring to an instance in which Sir Astley Cooper had successfully exarticulated the hip joint after a midthigh amputation, remarked that, as the patient had formerly suffered a midthigh amputation, the operation of the hip joint exarticulation was certainly unlike the sudden removal of nearly a quarter of him. The opinion that hip joint exarticulation performed after a midthigh amputation was much less likely to be fatal was also expressed by Gross,[8] Van Buren,[9] Packard[10] and Otis.[11] It would seem, however, that the evidence supporting this belief was not convincing, since it is based for the most part on observations of primary hip joint amputations and reamputations through the hip joint after severe wounds of the thigh.

PROPHYLACTIC INOCULATION AGAINST YELLOW FEVER *

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Sufficient grounds for the possibility of establishing a prophylactic vaccination against yellow fever are furnished by the facts that (1) a person acquires a state of complete immunity enduring for a period of years after recovery from an attack of yellow fever, and (2) the serum of such a person, and also of guinea-pigs once inoculated with the blood of yellow fever patients, contains varying amounts of antibodies against *Leptospira icteroides*.[1] That such vaccination is a distinct possibility is shown in these experiments:

VACCINATION IN GUINEA-PIGS

In the first series of experiments, carried out in Ecuador, thirty guinea-pigs ranging in weight from 280 to 320 gm., and recently received from mountainous districts, were divided into three equal groups and inoculated subcutaneously with the killed culture of *Leptospira icteroides* (heated at 60 C. for fifteen minutes in a water bath) containing about 500,000 organisms per cubic centimeter, the first group receiving 1 c.c., the second 0.3 c.c., and the third, 0.1 c.c. All were kept under careful observation, daily records being made of the temperature and other reactions. Two weeks after inoculation they were tested for resistance to a virulent *Leptospira* culture of the Guayaquil strain No. 1, applied to the scarified surface of the skin. As controls, eight uninoculated guinea-pigs of similar weights were given the same culture in the same manner and at the same time. The culture employed was 10 days old and killed guinea-pigs within eight days in a dose of 1 c.c. of a 1:10,000 dilution by intraperitoneal injection. The results are recorded in Table 1.

As the table shows, the injection of the vaccine produced neither febrile nor local reactions in the guinea-pig.

By the use of a sufficient amount of killed culture of *Leptospira icteroides*, guinea-pigs were made resistant to a subsequent inoculation which invariably produced typical symptoms and lesions and death in normal guinea-pigs. A smaller amount (0.1 c.c. in the present series) conferred imperfect protection, although four of six animals remained well, and one recovered after a mild attack of the infection.

TABLE 1.—RESULTS OF VACCINATION OF GUINEA-PIGS AGAINST LEPTOSPIRA ICTEROIDES

Number of Guinea-Pig	Amount of Vaccine, C.c.	Local or Febrile Reaction	Subsequent Infection, After	Result of Infection	Pfeiffer Phenomenon After 4 Weeks
601	1	None	14 days	Well	Positive
602	1	None	14 days	Well	Positive
604	1	None	14 days	Well	Positive
605	1	None	14 days	Well	Positive
607	1	None	14 days	Death in 10 days without jaundice	
609	1	None	14 days	Well	Not done
610	1	None	14 days	Well	Not done
611	0.3	None	14 days	Well	Positive
613	0.3	None	14 days	Well	Positive
614	0.3	None	14 days	Well	Positive
615	0.3	None	14 days	Well	Positive
618	0.3	None	14 days	Well	Positive
620	0.3	None	14 days	Well	Not done
622	0.1	None	14 days	Death in 12 days; typical	
623	0.1	None	14 days	Well	Positive
624	0.1	None	14 days	Slight icterus after 9 days; recovered	Positive
625	0.1	None	14 days	Well	Positive
627	0.1	None	14 days	Well	Positive
629	0.1	None	14 days	Well	Positive
Controls					
631	Death in 9 days; symptoms and lesions typical				
632	Death in 9 days; symptoms and lesions typical				
633	Death in 11 days; symptoms and lesions typical				
634	Death in 9 days; symptoms and lesions typical				
635	Death in 13 days; symptoms and lesions typical				
636	Death in 3 days through an intercurrent infection				
637	Death in 10 days; symptoms and lesions typical				
638	Death in 11 days; symptoms and lesions typical				

Other series of experiments have been carried out by one of us (Noguchi) at the Rockefeller Institute with guinea-pigs of American stock. The results were similar to the foregoing and will be published in detail later.

EFFECTS OF VACCINATION IN MAN

The almost total absence of any constitutional or local reaction except the development of a subsequent definite immunity following the injection of a killed culture of *Leptospira icteroides* into guinea-pigs furnished a basis for applying this procedure to nonimmune persons for the purpose of protection. There is great need of a prophylactic measure in countries in which yellow fever still prevails and in which a nonimmune population may become exposed to the disease. The nonimmune population, of course, avoids visiting the yellow fever foci through dread of the disease, and the supply of labor and other commercial and industrial relations is thereby seriously affected. Yellow fever in such countries becomes an important national economic issue.

7. Cooper, Samuel, quoted by Otis (Footnote 11).
8. Gross: A System of Surgery, Ed. 3, Philadelphia **2**:1046, 1864.
9. Van Buren: Contributions to Practical Surgery, Philadelphia, 1865, p. 10.
10. Packard: New York M. J. **2**:161.
11. Otis: A Report of Amputations at the Hip Joint in Military Surgery, Circular 7, U. S. War Department, Surgeon-General's Office, 1867.

* From the Laboratories of the Rockefeller Institute for Medical Research, New York, and the Yellow Fever Hospital, Guayaquil.
1. Noguchi, Hideyo: J. Exper. Med. **30**:1, 9 (July) 1919.

The trial of prophylactic vaccination against yellow fever in Ecuador was precipitated by the occasion of the national celebration that was to take place during the first part of October, 1918, in Gauyaquil. A battalion known as the "Vincedores," consisting chiefly of nonimmune soldiers from the highlands, was ordered to participate in the ceremony, and Governor Pareja of Guayaquil suggested the possibility of trying the anti-yellow fever vaccination on these soldiers. His suggestion was accepted by the military authorities and sanctioned by President Baquerizo. At the barracks in Guayaquil to which the battalion was ordered, approximately 300 soldiers are stationed regularly. During the period of six months from January to June, 1918, there had been fifty-eight cases of yellow fever with twenty-nine deaths in these barracks, which was an unusual outbreak. The introduction of sanitary measures (isolation of suspected cases by mosquito nets, the closing and frequent cleaning of drinking water tanks, etc.) had checked the epidemic, and only one officer died of yellow fever there between July and October, 1918.

A journey was made to Quito (9,000 feet above sea level), Sept. 18, 1918, and on September 20, eleven persons were inoculated in order that we might observe the effect of the vaccination. The histories and physical examinations of these men were made by Dr. Pareja, who excluded any one who was suspected to be immune or had any sign of ill health. Samples of the blood were taken from the median basilic vein before vaccination for tests of immune bodies for the leptospira and for comparison with serum drawn from the same individuals after the vaccination.[2]

The vaccine consisted of a rich killed culture of the Guayaquil strain No. 1 containing about 2,000,000 leptospiras per cubic centimeter, heated in a water bath at 60 C. for fifteen minutes, and used ninety-six hours after killing; no antiseptics were added. The heated organisms were fragmented, tortuous and granular, the original forms being no longer recognizable; the liquid was slightly grayish, but limpid. Inoculations were made subcutaneously, usually on the left upper arm, and different doses were used, four persons receiving 1 c.c.; four, 0.3 c.c., and three, 0.1 c.c.

The local reactions comprised a slight reddening (a few centimeters square, without induration) of the injected area, which persisted about twenty-four hours; in only one instance was it somewhat more extensive; it endured forty-eight hours, but was not more painful than might have been expected from the mechanical effect of the injection. Subjectively, some experienced a slight dulness in the head, but all slept well, and the appetite was unaffected. In one instance there were slight pains in the shoulders which disappeared within forty-eight hours. There were slight brachycardia and hypothermia, which began after about ten hours and lasted from twenty-four to forty-eight hours; in one instance the pulse rate went down to 50, and in several to 56. At the same time the temperature was about 1 to 2 degrees C. below normal. These objective effects were by no means proportional to the amount of vaccine injected. Within seventy-two hours all symptoms had disappeared.

A second inoculation of the same doses was made, Sept. 24, 1918, in three individuals of the 1 c.c. group, one of the 0.3 c.c. group, and two of the 0.1 c.c. group. No local or constitutional reactions followed. September 26, blood was drawn from all the inoculated persons for the purpose of determining the leptospiricidal properties of the serum.

The serums taken before and after vaccination were examined, September 30, for the Pfeiffer phenomenon. To 2 c.c. of the serum was added 1 c.c. of a rich, actively motile culture of the No. 1 strain, and the mixture was introduced into the peritoneal cavity of a normal guinea-pig. After from thirty minutes to one hour the fluid was pipetted from the peritoneal cavity and examined under the dark field microscope. The results of this examination in ten soldiers, and the subsequent fate of the animals used, are recorded in Table 2.

TABLE 2.—RESULTS OF VACCINATION AGAINST LEPTOSPIRA ICTEROIDES IN TEN HUMAN BEINGS

			Serum Taken Before Vaccination		Serum Taken After Vaccination	
Soldier No.	Dose, C.c.	Number of Vaccinations	Pfeiffer Phenomenon	Fate of Animals	Pfeiffer Phenomenon	Fate of Animals
1	1	2	—	Death in 5 days	+	Survived
2	1	2	—	Death in 6 days	+	Death in 9 days
3	1	2	—	Death in 6 days	+	Survived
4	0.3	2	—	Death in 6 days	+	Survived
5	0.3	1	—	Death in 6 days	+	Death in 9 days
6	0.3	1	—	Death in 5 days	+	Death in 7 days
7	0.3	1	—	Death in 4 days	+	Death in 8 days
8	0.1	2	—	Death in 6 days	+	Death in 8 days
9	0.1	1	—	Death in 5 days	+	Death in 7 days
10	0.1	1	—	Death in 6 days	+	Death in 8 days
Saline control.....			—	Death in 5 days		

The serums of the ten soldiers taken previous to vaccination had no action on the organisms either in respect to the Pfeiffer tests or the subsequent course of the infection in the guinea-pigs injected with them, while the serums taken after vaccination gave a positive Pfeiffer reaction even when the amount of the killed culture inoculated had been as small as 0.1 c.c. The final infection, however, was not prevented in most instances, the animals receiving the serums from persons vaccinated with a single dose of 0.3 c.c. and single or double doses of 0.1 c.c. all developing typical symptoms and dying after a period involving delays of from two to four days, as compared with those receiving the normal serums. In the case of the four animals that received serum from soldiers inoculated twice with 1 c.c. and 0.3 c.c., however, there were three that survived. Hence it may be concluded that, given a sufficient amount of the killed culture, not only the Pfeiffer phenomenon but also the protection of the animal against the infection with a large amount of the virus may be brought about in human serum. The results from the serum of soldiers receiving smaller amounts of the killed culture, in which the animals finally succumbed to infection notwithstanding a positive Pfeiffer reaction, were to have been expected, in view of the enormous quantity of culture used in the tests; moreover, it does not follow that the soldiers yielding these serums were not protected against a natural leptospira infection, since under natural circumstances infection of man is never induced by such large numbers of the organism. Indeed, it may be assumed that the number of leptospiras introduced into the human body by the mosquito is small and probably readily taken care of in persons whose serum contains antibodies enough to give a positive Pfeiffer reaction. It will, of course, be advisable to adopt double or triple injections of the vaccine for prophylactic inoculation, when possible.

2. We are indebted for these specimens to Dr. Carlos A. Mino, assistant director of the department of health at Quito, to Dr. E. Salgado V., also of the department of health, and to Dr. Victor M. Bayas, surgeon of the "Bolivar" Regiment.

September 24, 149 soldiers of the battalion mentioned were inoculated in Quito with the same vaccine, 120 being given 1 c.c. and the remainder 2 c.c. The same brief effects, namely, brachycardia and a drop in temperature, were noted. In only one instance were marked headache, loss of appetite and muscular pains complained of. In this officer a mild urticaria, which disappeared in about nine days, developed around the site of injection. A boy soldier of 14 years had a pulse rate as low as 44 on the day following the vaccination, but had no subjective symptoms.

October 8, the day after their arrival at Guayaquil, the remainder of the battalion Vincedores and their families, including women and children (176 persons), were inoculated with a vaccine killed with 0.5 per cent. phenol.[3] At this period the culture material on hand had been nearly exhausted; a culture much inferior to the first was utilized, and the number of vaccinations to be carried out necessitated diluting the small amount of material available; hence the resulting vaccine preparation (Vaccine B) was only one-fifth the strength of that previously used in Quito (Vaccine A).

Of the 149 soldiers who were vaccinated in Quito, three who had received 1 c.c. of vaccine (Vaccine A) later contracted yellow fever in Guayaquil 35, 93 and 99 days, respectively, after vaccination; the first case was fatal (Table 3).

TABLE 3.—YELLOW FEVER INCIDENCE AMONG VACCINATED PERSONS

Name	Age, Years	Vaccine Preparation Employed	Amount Injected, C.c.	Date of Vaccination	Date of Onset of Yellow Fever	Time Between Vaccination and Onset, Days	Result
M. M.	34	Vaccine A	1	9/24/18	10/29/18	35	Died 7th day
M. B.	22	Vaccine A	1	9/24/18	10/29/18	93	Recovered
F. M.	28	Vaccine A	1	9/24/18	1/ 4/19	99	Recovered
B. R.	40	Vaccine B	1	10/ 8/18	10/14/18	6*	Died 5th day
J. M. C.	10	Vaccine B	1	10/ 8/18	10/28/18	20	Died 9th day
M. P. V.	19	Vaccine B	1	10/ 8/18	11/ 6/18	29	Recovered

* An instance in which the patient had contracted yellow fever before the vaccination had conferred any immunity.

Of the 176 soldiers and their families vaccinated after their arrival in Guayaquil, one, who had received 1 c.c. of Vaccine B, developed yellow fever six days after vaccination and died on the fifth day of illness. This case may be regarded as a control, since the vaccination could not have conferred any protection within this short period. Two more cases, occurring among the persons vaccinated in Guayaquil with Vaccine B, one twenty days (fatal) and the other twenty-nine days (recovered) after the vaccination, demonstrate either that the amount of vaccine given was insufficient, or that these individuals were unusually susceptible to the leptospira infection—a phenomenon observed also among vaccinated animals.

It may be noted that among the persons receiving 2 c.c. of Vaccine A, none contracted yellow fever, and that of the three persons who developed yellow fever notwithstanding the injection of 1 c.c. of Vaccine A, two recovered. The incidence of yellow fever among the vaccinated and that among the unvaccinated nonimmune population of Guayaquil may be roughly compared by referring to the yellow fever statistics published by the Department of Health of Guayaquil for 1918-1919[3] (Table 4). During the months of October, November and December, 1918, and January, February and March, 1919, 386 cases of yellow fever occurred in Guayaquil, with 217 deaths (56 per cent.). The nonimmune population of the city, which is not accurately known, must have been comparatively small; hence the yellow fever incidence among the vaccinated (five cases among a total of 427) was strikingly low in comparison with that among the unvaccinated nonimmune population, and the mortality was also low (33 per cent. of the Vaccine A group, and 40 per cent. among both groups).

TABLE 4.—YELLOW FEVER INCIDENCE AT GUAYAQUIL IN 1918-1919

Year	Month	Number of Cases Occurring	Deaths	
			Number	Percentage
1918	October	72	41	57
	November	81	43	52
	December	88	46	52
1919	January	85	51	60
	February	43	22	52
	March	17	14	80

Following the inauguration of a rigorous antistegomyia campaign (December, 1918) throughout Ecuador under the department of health (Dr. Becerra) with the cooperation of the International Health Board (Dr. M. E. Connor), the yellow fever incidence became gradually so reduced that in May, 1919, only a single case occurred, and since that date the country has remained free from the disease[4]; hence the prophylactic value of the vaccination could no longer be tested in Ecuador.

During 1919-1920, the northern districts of Peru, the countries of Central America, and certain localities in Mexico have been invaded by yellow fever, and the vaccination has been practiced on a large scale by several sanitary experts (5,000 vaccinations in Salvador and Guatemala by Dr. T. C. Lyster, Dr. C. A. Bailey, and Dr. E. I. Vaughn in 1920 of the International Health Board), who will no doubt publish their findings in time.

The concentration of the vaccine now prepared at the Rockefeller Institute is such that 1 c.c. contains about 2,000,000,000 organisms. About 0.2 per cent. agar is being used in the culture medium, and the culture is diluted with twice or more its volume of saline solution at the time of making the vaccine. The presence of agar in the vaccine is objectionable, as it may rarely remain unabsorbed, leading to sterile abscess formation; notwithstanding repeated efforts, however, we have not yet succeeded in growing *Leptospira icteroides* abundantly in a liquid medium; but by careful massage at the site of inoculation, the absorption of the agar is facilitated and the abscess formation prevented. Dr. Lyster and his associates, in their series of 5,000 vaccinations, have observed only six instances of sterile abscess, which occurred two weeks ofter inoculation.

SUMMARY

From the results of vaccination in guinea-pigs, it may be concluded that when sufficient quantities of the killed culture are given, these animals are usually rendered resistant to a subsequent infection with *Leptospira*. The degree of protection, however, is not strictly proportional to the amounts of the vaccine inoculated.

3. Subsequently 102 additional vaccinations were carried out (with more concentrated vaccine), making the total number of vaccinations in Ecuador 427. See the Boletin Trimestral de la Oficina de Censo, Estadistica, y Despacho, Municipal de Guayaquil 2, Nos. 1 and 2, 1919.

4. Comercio Internacional, Guayaquil, January, 1920, page 53. Connor, M. E.: Yellow Fever Control in Ecuador, J. A. M. A. 74:650 (March 6) 1920; 75:1184 (Oct. 30) 1920.

As regards the vaccination of human beings, thus far the results are distinctly encouraging; but we realize that many more observations will be needed before a final decision of its value can be arrived at.

BLACK SPIDER POISONING

REPORT OF FOUR CASES

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The black spider is common in Mexico and is extremely poisonous. It looks like an ordinary spider, but it is black, with a few white spots on the body. The legs are of the same length as those of an ordinary spider of comparable size. The body is half an inch long and a quarter of an inch wide.

Three or four hours after a person has been bitten, a pustular eruption develops, with three or four pustules containing a watery fluid. The pustules increase in size and sometimes become as large as peas. The affected area becomes swollen and edematous. The edema of the skin resembles that of renal or cardiac dropsy. If the bite is on the hand, this hand will appear twice as large as the unaffected hand; the neighboring glands become enlarged, and there will be enlargement of the glands of the whole arm, and some of the glands of the neck and maxillary region. There is nausea and vomiting, and the patient feels ill and slightly feverish. The skin over the affected area is warm; the patient is restless and nervous. The pain becomes severe, traveling upward along the nerve, and the arm becomes so heavy that the patient is compelled to hold it with his unaffected hand.

Treatment consists in applying gauze wet with a saturated solution of magnesium sulphate to the affected area, with internal administration of 4 minim doses of iodin.

REPORT OF CASES

CASE 1.—F. R., a man, aged 31, retired at 9:30 p. m., Sept. 10, 1920, in his usual good health. About 4 o'clock next morning he was awakened by severe pains over the fifth metacarpal bone of the left hand. The hand was swollen, and by 7 o'clock was nearly twice the size of the right hand. At 9, when he came to the clinic, he was restless and looked toxic. On the affected area were three pustular eruptions containing a watery fluid. I painted the area with iodin and gave calomel and magnesium sulphate. At 4 p. m., when he returned to the clinic, he was feeling worse; the whole arm was swollen and a streak appeared, traveling upward. The patient looked so toxic that I feared he would die in spite of all I could do. I painted the area again with iodin. September 11, at 9 a. m., the patient complained of headache and his temperature was 101 F. I wet a piece of gauze with saturated solution of magnesium sulphate and covered the hand and part of the arm with it. At 5 p. m., there was some improvement. I gave the patient a pint of the solution and directed him to keep the gauze saturated with it. Next morning the swelling was almost entirely gone. He had slept well, applying the solution four times during the night. On the fourth day the swelling had virtually disappeared, and on the seventh day the patient resumed work, entirely well. I gave him internally iodin, calomel and magnesium sulphate.

CASE 2.—C. H., a man, aged 32, who had always had good health, woke up during the night of September 18 with severe pain in the testicles. September 19, at 10 a. m., when I saw him, they were palpable and of normal size, and the condition looked like hydrocele. The penis measured 4½ inches in length, about 2 inches in diameter, was twisted and edematous, and resembled a heavy, twisted rope. I applied gauze saturated with magnesium sulphate to the genitals and gave iodin, calomel and magnesium sulphate internally. On the fifth day the patient was well. He remained in bed. On the tenth day he resumed work.

CASE 3.—A. D., a woman, aged 28, woke on the morning of October 3 with pain and heat in the right cheek. Next morning, when I saw her, the right side of the face was red, hot and swollen, and the condition resembled erysipelas. The eye was swollen, and the patient could hardly open the mouth. I thought at first that she had toothache, but discovered that she had been bitten by a black spider. She said she had headache and had vomited before coming to see me. This patient was treated with saturated solution of magnesium sulphate, and on the fifth day was entirely well.

CASE 4.—S. G., a man, aged 32, who had previously enjoyed good health, awoke, October 12, with pain and swelling of the right leg below the knee joint. He consulted me, October 13, appearing to have cardiac or renal dropsy, but stated that he had been bitten by a spider. I had the patient put to bed, elevated the foot of the bed, applied saturated solution of magnesium sulphate, and administered iodin internally, with calomel and magnesium sulphate for catharsis. In this case there were enlargement of the femoral glands and red streaks up the thigh. The patient was restless so that I administered bromids, but he was well by the tenth day and went to work as usual.

COMMENT

The magnesium sulphate apparently relieves the pain, reduces the swelling and prevents the progress of the disease. In none of the cases were bacteria found in blood or serum, and examination of the urine was negative. Blod counts revealed a slight increase in leukocytes, about 8,000 or 9,000.

NEW ROENTGENOTHERAPY IN CANCER *

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On my visit to Germany last summer, I had occasion to learn of the marked advances in roentgenotherapy during the last year and a half. The technic has undergone great changes; in particular, accurate measurements have been established, thus making possible exact dosage in carcinoma, sarcoma and benign tumors. These improvements are obviously due to the construction of more powerful roentgen-ray apparatus, and with it new tubes to accept a high tension voltage. It is hardly worth while to dwell at length on the former shortcomings except for comparisons: With the older machines it was impossible to obtain sufficient radiation to penetrate farther than from 3 to 5 cm. to an appreciable extent, while the new type of inductor or transformer develops hard rays capable of penetrating the entire body. Formerly, the greatest intensity obtainable from the older type apparatus and that in use here ranged from 80,000 to 140,000 volts, whereas the modern roentgen machine operates with an intensity of from 180,000 to 220,000 volts. It should be borne in mind that 3 mm. of lead was sufficient to absorb all the rays from the former roentgen-ray apparatus, compared with the 25 mm. of lead necessary to absorb the hard rays of the modern type.

EFFECTIVE RADIATION

The need of more powerful roentgen-ray intensity made it apparent that the construction of tubes tol-

* Read before the New York Physician's Association, Nov. 23, 1920.

erating this high tension voltage offered the most difficult problem. As a result of the most painstaking labor by the ablest physicists, three standard types of tubes are now in use. They are the Lilienfeld tube, a vacuum tube used with the Radio-Silex machine, the Müller Siede-röhre, a gas tube with hot water circulation and a self-regulating device for hardening, and lastly the Furstenau-Coolidge tube, a larger and much improved Coolidge tube. All three give equally good results. These tubes are capable of operating with a 16 to 18 inch spark gap, compared to the 9 or 10 inch spark gap of the older type, and of running constantly from eight to ten hours a day. The quality of rays is necessarily better and the quantity greater, containing larger amounts of hard rays and consequently greater penetration.

The improvement of apparatus and tube in turn led to the study of accurate measurements of dosage and ray absorption in the deeper tissues. It was found, for instance, that the bundle of rays emitted from a roentgen-ray target at a certain point of filtration effects an even and homogeneous radiation, and cannot be altered qualitatively by further filtration. This point is called the homogeneous point. In other words, rays filtered from this point on possess the same quality of hardness no matter how much more filter is used, and these are the rays now used in the technic of modern roentgenotherapy.

DOSAGE

The next advance was the determination of the exact dosage, dispersion and absorption coefficient. This was made possible by means of delicate instruments of precision, as the electroscope of Wulf, and the ionizing chamber of the new iontoquantimeter of Szillard. For instance, it is possible with a 220,000 volt energy from the new apparatus to obtain 30 per cent. of homogeneous ray at a depth of 10 cm.; and if to this is added the scattered and secondary ray, it amounts to nearly 40 per cent. of a skin erythema dose. This amount of penetration has enabled a cancer of the uterus, for instance, situated from 7 to 10 cm. under the surface, to receive 40 per cent. of a lethal dose directed from the abdomen. Another 40 per cent. can be administered from the back and, if necessary, from 10 to 15 per cent. from each side, making a total of 100 to 110 per cent. of a skin erythema dose. Biologically and experimentally, it has been established that from 85 to 90 per cent. of a skin erythema dose will destroy cancer tissue, so that it is easily possible to administer a sufficient and effective amount with this technic. If, however, the full cancer dose has not reached the center of the tumor mass, then the desired dose can be realized by placing a small amount of radium in the uterus.

After all, the important feature to keep in mind is that it is absolutely necessary that every part of a cancer of the uterus, for instance, receives a full and lethal cancer dose to bring about the desired result. On the other hand, if any part of the tumor has not received the full dose, a recurrence is sure to follow. If the total amount absorbed by the tumor is 40 per cent. of a skin erythema dose or less, it will stimulate the tumor growth instead of destroying it. The lack of accurate measurements and the inability to obtain a sufficient amount of hard and penetrating ray in the affected parts has been responsible for previous failures.

It will be evident to every one that an exact clinical knowledge of the location of the tumor is requisite, in order to calculate the correct dosage: the size of the tumor, the depth of the tumor beneath the skin, and also the involvement of the parametrium, etc., must be determined. All parts of the tumor must receive the same homogeneous radiation, and preferably in one treatment. There is a definite reason for this, as one dose properly administered is more effective than smaller doses given repeatedly. With a small dose the radiated tissue has time to recuperate, and every repeated dose requires a larger amount of radiation, and with it more strain on the overlying skin.

Another factor of great moment is the preservation of the connective tissue, which is so essential in the recession of a tumor. Along with this it is important to conserve the adjacent normal tissue, and not to subject the bladder, rectum and colon to irreparable damage. Fortunately, the bladder and rectum tolerate a dose a trifle higher than the skin; and since the dose for carcinoma is 85 and that for the skin 100, the correct radiation dose allows enough free play to prevent damage to the bladder and rectum. Injury to these organs and rectovesical fistula resulted formerly simply because a cross-fire radiation was directed to the tumor, and the overlying or underlying tissue received twice the dose of the tumor.

METHODS OF TREATMENT

From these preliminaries it is easily conceivable that an intelligent administration of roentgenotherapy requires more than a mere knowledge of the roentgen ray; for clinical exactness and therapeutic skill as to dosage and absorption are just as essential to the radiotherapist as surgical judgment plus surgical technic is to the surgeon. It must be evident, therefore, that it is difficult to set down a hard and fast rule for the treatment of every case of cancer.

In Bumm's clinic in Berlin, for instance, cancer of the uterus is radiated in four fields: one large field over the abdomen, one directed from the back, and one from each side. The distance of the tube from the skin is 30 cm., and 0.8 mm. of copper is used as a filter. As a general rule the intensity of 190,000 to 200,000 volts with a 16 inch spark gap is used, and it requires ninety minutes with this high tension voltage to obtain an erythema dose. In all, four fields are radiated at ninety minutes each, 360 minutes—six hours'—treatment. This dose is administered at one sitting, and after the treatment a transfusion of blood is given intravenously and the patient is put to bed for a few days' rest, as there is considerable damage to the blood.

At Seitz and Wintz's clinic in Erlangen, six or seven fields are radiated, three in front, two from the back, and one into the vagina. The focal distance is 23 cm. with a 16 inch spark gap, and 0.5 mm. copper or zinc filter. With their technic, each erythema dose requires thirty-five minutes, or from three and one half to four hours in all. This procedure is repeated twice at intervals of six weeks, one treatment for each parametrium. To many therapists this seems objectionable, as too much time elapses before a complete knockout dose is given, and if the cancer is a very malignant one, the spread may be too rapid to allow this time interval. Besides, it seems an unwarranted strain to subject the skin to three times an erythema dose.

In the gynecologic clinic of Opitz in Freiburg, the focal distance used is 50 cm., and four fields are radiated at 120 minutes each at one sitting of eight hours. The results are astoundingly favorable; for instance, in Freiburg no cancer of the uterus has been operated on since Jan. 1, 1919. In a private communication,

Opitz presented me with his figures of sixty-three cases of cancer of the uterus since that date, forty-one cases of cancer of the cervix, and twenty-one of the body of the uterus. Of the forty-one cervix cases, twenty-two had receded, ten were not influenced, and nine patients died. Of his twenty-one cases of cancer of the body of the uterus, seventeen, or 80 per cent., receded, two were not influenced, and two patients died.

Wintz reported to me that he had radiated about 3,000 cases of cancer of the uterus in the last seven years. In about 70 per cent. of the cases of cancer of the body of the uterus, the disease was arrested over a period of four years, and in the cervix cases, 45 per cent. of the patients were alive after four years. These figures are perfectly astounding, but will be better understood when it is taken into consideration that in 1919, 7,000 radiation doses were administered in this clinic, in a small town of 27,000 inhabitants. There are eight roentgen apparatus of the latest type in use there for from eight to ten hours daily.

Carcinoma of the breast in their clinic is treated with an entirely new technic. Here, especially, has roentgen therapy undergone considerable change. Cancer of the breast does not adapt itself to the same method of radiation as that of the uterus. In one, the tumor is situated virtually in the midplane of the pelvis; half of a cancer dose can be administered from the abdomen, and an equal dose from the back, so that both sides furnish the full carcinoma dose. In the breast, however, the malignant growth is situated from 3 to 5 cm. beneath. Fortunately, this has been accomplished in the following manner: The tube is put at a distance of from 70 to 90 cm. from the skin; thus, only the hardest and most penetrating rays are used through a filter of 0.8 mm. of copper. By increasing the focal distance, the time of obtaining an erythema dose is also greatly increased (since the intensity of the ray diminishes inversely as the square of the distance). With 70 cm. distance, 320 minutes are necessary; but with 90 cm., 535 minutes, or nearly nine hours, are required. In this manner from 85 to 90 per cent. of a skin erythema dose penetrates from 3 to 5 cm. under the surface of the skin, and in the majority of cases the tumor is generally not deeper. If the patient is restless, morphin or scopolamin is ordered. At the cancer institute in Berlin, four fields are used in breast cancers, one over the breast, one over the back, one in the axilla, and one over the supraclavicular region, each field for 120 minutes, or a total of eight hours. I have seen report for observation there in one day thirty-five patients with cancer of the breast which had been radiated two, three or four years previously, nearly all of them with gratifying results. Whenever there is axillary glandular involvement they prefer roentgenotherapy rather than the knife.

This brings me to another interesting phase of radiation, bearing especially on cancer of the breast. Throughout virtually all Europe, notably in England, it is the rule to administer a preoperative roentgen-ray dose to the operative field. It has been shown experimentally that radiated cancer cells do not grow on transplantation. This has been taken advantage of by the surgeon, reducing to a minimum the risk of transplanting cancer cells during the surgical removal of carcinoma of the breast. Of course, this also applies to cancer situated elsewhere.

Carcinoma of the prostate is treated like a carcinoma of the uterus; the same method of raying is adopted with the addition of radium applied by rectum. It is asserted that the results are equal to those in cancer of the uterus.

The sarcoma dose as a rule is smaller than that of carcinoma, namely, from 60 to 70 per cent. that of a skin erythema dose. As a general rule, sarcomas are favorably influenced by roentgenotherapy, especially lymphosarcoma in the early stage.

Cases of osteosarcoma in the young responded to intelligent radiation, provided no general sarcomatosis was present. Osteomyelitis sinuses and fistula, and tuberculous joints were treated with the same technic, with gratifying results. Multiple bone fistulas of several years' duration were shown to me completely healed.

In uterine myomas a special technic has been adopted. Formerly, three or four series at three weeks' interval were administered. This protracted the establishment of amenorrhea over two or three months or longer. Nowadays the entire treatment is effected in one session of from one and one-half to two hours. At Opitz's and also Bumms' clinic, only two large fields are taken, one in front and one in the back. Each field is radiated for forty minutes, in all eighty minutes. During the treatment, exact measurements are read from the iontoquantimeter in the vagina.

In Erlangen, four fields are radiated for thirty minutes each, by means of a compression tubus. This compression appliance brings the surface of the body nearer to the tumor, and a greater amount of ray absorption can thus be obtained. The biologic dose for atrophy of the ovary is from 25 to 30 per cent. of a skin erythema dose.

According to Seitz and Wintz, and other observers, 85 per cent. of fibroids either shrink or disappear entirely, and in virtually all cases castration results. Moreover, they assert, malignant degeneration of fibroids offers no contraindication to radiation, since radiation here is just as applicable as to any other cancer of the uterus.

SUMMARY

In the light of what has been said, we can thus summarize the progress in roentgenotherapy and technic:

1. There have been constructed powerful high tension transformers, and induction apparatus, with tubes to accept from 200,000 to 220,000 volts.

2. The determination of the homogeneous point and correct filtration through copper or zinc has brought about effective radiation.

3. Exact dosage for carcinoma tissue, 90 per cent. of a skin erythema dose, for sarcoma 70 per cent., and for the ovary 25 per cent., has been established.

4. By the preoperative application of radiation, the danger of transplanting cancer cells during operation is minimized.

5. Fibromyomas respond to one treatment of from one and one-fourth to two hours, resulting in complete castration.

6. It is most important that all parts of the tumor receive an even and homogeneous radiation sufficient to destroy all the cancer tissue, and thus prevent recurrence.

7. Clinical knowledge as to the location of the tumor and its biology must accompany the skill of the roentgenotherapist that he may intelligently select or combine surgery, radium and the roentgen ray.

8. My own experience with this new technic since my return coincides at present with the work reported abroad, and I hope to be able to give more detailed reports in the future.

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THE URINE IN SYPHILIS

REPORT OF LABORATORY STUDIES, INCLUDING THE WASSERMANN REACTION, IN SIXTY CASES *

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Our purpose here is to review the knowledge that has been acquired concerning the laboratory aspects of the urine in syphilitic infection, and to report laboratory studies in this subject.

THE URINE IN ACUTE SYPHILIS

Attention has frequently been called to the occurrence of albumin and casts in urine during the acute stage of syphilis. We examined the urine in forty-three cases of untreated primary syphilis, the duration of which was from a few days up to the time of cutaneous manifestation. The urine showed abnormalities in three cases; the remaining forty were entirely negative. In forty-six cases of untreated secondary syphilis, the urine was abnormal in four and entirely negative in the remaining forty-two. Of the seven positive cases, all showed albumin and granular casts, excepting two in which casts were absent. In two cases red blood cells were additional findings. The albumin present was a trace except in two of the secondary cases, when it consisted of a light cloud, with many granular casts and in one, red blood cells. Neither case showed clinical evidence of nephritis. The urinary findings in the seven positive cases disappeared promptly after treatment with arsphenamin and mercury.

The albuminuria which we have observed as occasionally present in the acute stage of syphilis is spoken of, and justifiably so, as "transient albuminuria." The exact nature of the underlying pathology is not definitely known. It has been compared to the albuminuria in other acute infectious diseases and similarly regarded as due to the excretion of the metabolic products—toxins, induced by the organisms, the cause of the acute infection. The nephritis is accordingly called toxic. The same explanation is given by all writers for the transient albuminuria in acute syphilis, rather than that it is due to the direct effect of the syphilitic virus in the kidney tissue.

It is not known which explanation is correct. It appears to us that the term "syphilotoxin" is too loosely used. Our knowledge concerning the toxins produced by *Spirochaeta pallida* is nil. We do know that the spirochete has a proclivity for invasion and localization of the viscera in the acute stage of syphilis. It therefore appears that the albuminuria in secondary syphilis is in all probability due to an acute invasion of the kidney by the spirochete. The variable amount of albumin from a trace to a heavy cloud, which latter is characteristic of what is generally known as acute syphilitic nephritis, is no doubt an index of the degree of involvement of the same pathologic process, namely, syphilitic nephritis.

In some of the eighty-nine cases of acute syphilis we performed a functional renal test with phenolsulphonephthalein and estimated the amount of urea in grams per liter of blood. Our findings in all cases examined were within normal limits.

THE URINE IN ACUTE SYPHILITIC NEPHRITIS

Early in syphilitic infection there occurs at times clinical evidence of an acute nephritis with rather characteristic urinary abnormalities. This condition is generally called acute syphilitic nephritis, in contrast to the transient albuminuria as described above. Although many such cases have been reported, yet, in view of the prevalence of syphilis, its occurrence is relatively rare. This condition has been studied and cases reported notably by Rayer,[1] Mauriac,[2] Fournier,[3] and more recently by Audrey,[4] Munk,[5] Stengel and Austin,[6] Stokes,[7] Fowler,[8] Cole[9] and Thompson.[10] Cases have been reported occurring in the primary period of syphilis and at variable periods up to two and three years after infection. The majority, however, become manifest a few months after infection. Clinically, there occurs evidence of nephritis, particularly edema, which is characterized by its rapid onset and marked degree. Uremia may or may not occur. The urinary findings are characterized by the enormous amount of albumin. Cases have been reported in which the amount was as high as 53 gm. per liter. Casts of various types are present which are proportionately less than the amount of albumin. Red blood cells are frequently seen. The nephritis is further characterized by the marked improvement following treatment with mercury or arsphenamin, particularly the latter drug.

An important urinary aspect of acute syphilitic nephritis has been shown by Munk.[5] He demonstrated that the urine in these cases is always characterized by the presence of doubly refractile lipoids, and only occasionally present in the urine of patients with severe nephritis due to other causes. These lipoids, through the ordinary microscope, appear as fat globules. Through the Nichols polariscope they show as a dark central cross separating four bright peripheral quadrants.

In chemical composition, these bodies are in all probability cholesterin esters and, like similarly constituted doubly refractile globules, may lose their characteristic optical properties by changes in physical conditions, such as heating, drying or freezing. The explanation of their constant presence in the urine of patients with syphilitic nephritis is not known.

Stengel and Austin[6] examined the urine with a polariscope in forty-six cases. Of this number, twenty-three

* From the Dermatological Research Institute.

1. Rayer, P.: Traité des maladies des reins, Paris, **2**: 485, 1840.
2. Mauriac, C.: Syphilose des reins, Arch. gén. de méd. **2**: 385-389, 1886.
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5. Munk, F.: Kleinische Diagnostik der degenerativen Nierenerkrankungen: I. Sekundär-degenerative-primär-degenerative Nierenerkrankung; II, Degenerative syphilitische, Ztsch. f. klin. med. **78**: 1-52, 1913.
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8. Fowler, H. A.: Syphilis of the Kidney, Medicine and Surgery, **2**: 54-70, 1918.
9. Cole, H. N.: Acute Syphilis of the Kidney, Am. J. Syph. **4**: 46-49 (Jan.) 1920.
10. Thompson, Loyd: Syphilis of the Kidney, J. A. M. A. **75**: 17 (July 3) 1920.

showed nephritis with an abundance of albumin and casts in the urine. Of these twenty-three cases, there were positive Wassermann reactions in six, strong presumptive evidence of syphilis but not positive Wassermann reactions in three, and no evidence of syphilis in fourteen. The six cases with positive Wassermann reactions all showed lipoids in the urine, whereas of the fourteen nonsyphilitic cases only five showed lipoids in the urine. The remaining twenty-three cases composed nephritic cases of the interstitial or arteriosclerotic types, with only traces of albumin in the urine and a few hyaline and granular casts, some with syphilis and some without, syphilitic cases with no nephritis, and control cases with neither syphilis nor nephritis. None of these cases showed lipoids in the urine. These writers state that similar lipoid globules may be found in severe acute or chronic parenchymatous nephritis of other etiology, but only in a minority of cases. They further noted the absence of these lipoids in the urine of experimental uranium and chromate nephritis. It would therefore appear that the presence of doubly refractile lipoids in the urine of severe nephritis is not pathognomonic, but highly suggestive of syphilis as the cause.

K. P. A. and S. P. Taylor [11] examined the urine of fifty syphilitic patients in the early stage of the disease, for the presence of doubly refractile lipoids. The majority of the patients examined had been treated previously with arsphenamin or mercury. The examination was negative in all.

ABSENCE OF HOMOPRECIPITINS IN THE SERUM AND URINE OF SYPHILITIC PATIENTS

Owing to the large number of precipitin and coagulating reactions described in syphilis, we have thought it worth while to mix clear blood serum and urine from the same person for the presence of precipitin or precipitinogens in serum or urine; the serums and urines of twenty acute untreated secondary cases were tested in this manner with negative results in all. Either the antibody is absent in the serum, or the antigen from the urine or both may be absent as indicated by these results.

INFLUENCE OF ANTISYPHILITIC THERAPY ON THE URINE

It is well known that mercury causes considerably more kidney irritation than does arsphenamin or neoarsphenamin. Urinary abnormalities are therefore more likely to appear after therapy with mercury than with the arsenical preparations. In our experience we observed urinary abnormalities consisting of albumin and casts, principally granular, appear after a variable amount of mercury, which was administered in different ways.

No definite statement can be made regarding the amount of mercurial treatment required to produce renal irritation, except that its occurrence is rather frequent and more likely after intramuscular injections of the soluble salts of mercury, and less likely after oral administration of the drug. We have had no experience in this regard with intravenous or inhalation mercurial therapy. On the other hand, we have observed slight, and in some cases, no urinary evidence of renal irritation after intensive treatment with neoarsphenamin. However, arsphenamin is more irritating to the kidneys than neo-arsphenamin. Coqsistent with these observations is the statement of Wechselmann [12] that "according to all experience up to the present time, one is warranted in accepting the conclusion that a normal kidney is never functionally damaged by salvarsan, but that, on the contrary, disturbances of salvarsan elimination take place only with already diseased kidneys." Following intensive treatment with this drug we have observed in some cases one or more symptoms of chronic arsenic poisoning, yet the urine remained negative. These symptoms of arsenic poisoning were languor, papular, vesicular and erythematous skin eruptions, conjunctivitis, pigmentation, paresthesia of the fingers and lower extremities, and erythema of the soles of the feet.

These clinical observations are consistent with the pathology of acute and chronic mercurial and arsenic poisoning. In the former condition the kidneys, and to a less extent the gastro-intestinal tract, are the predominating organs involved. On the other hand, in arsenic poisoning the gastro-intestinal tract and to a less extent the kidneys are the predominating organs involved.

Mercury is eliminated by almost all the excretory organs, but largely by the kidneys and the intestine, the former organ at first playing the most important rôle and later the intestine. After mercurial administration the greatest amount can be found in the kidney and liver.

Arsenic is eliminated after arsphenamin and neoarsphenamin administration, chiefly through the kidney and intestine. In the feces the amount excreted is greater or equal to that excreted by the kidneys. The liver is the chief storehouse of arsenic after administration of arsphenamin or neo-arsphenamin.

Nichols [13] compared, experimentally, the tolerated and spirocheticidal dose of mercuric chlorid and mercuric salicylate when administered intravenously. He observed that the tolerated dose for mercuric chlorid was 0.001 gm. per kilogram, but no definite spirocheticidal action was present with this dose; if, however, the dose was increased to 0.003 gm., the spirochetes were destroyed in forty-eight hours; but the animal eventually died of nephritis. The tolerated dose of mercuric salicylate was 0.005 gm. per kilogram, which had no curative effect. A dose of 0.0075 or 0.01 gm. destroyed the parasites promptly, although the animal later died of nephritis. Nichols states that the margin between the parasitotropic action of mercury and the organotropic action is not nearly so great as it is with arsphenamin.

One of us (J. A. K.), in collaboration with Schamberg and Raiziss,[14] has shown in an experimental study of the comparative toxicity of the various preparations of mercury that this drug is powerfully nephrotropic and that the kidney is the first organ to show damage from the toxic effect of the drug. It was also shown that the experimental nephritis produced by mercury is primarily tubular in character. Capsular glomerulonephritis of the exudative (hemorrhagic) variety is frequent and virtually always accompanies severe tubular nephritis. Calcification of the degenerative tubular cells has been found within forty-eight hours after the administration of mercury, and occurs in

11. Taylor, K. P. A., and Taylor, S. P.: A Study of the Urine of a Group of Syphilities for Doubly Refractive Bodies, read before the Pathological Society of Philadelphia, Oct. 14, 1920.

12. Wechselmann, W.: The Pathogenesis of Salvarsan Fatalities, Trans. by Clarence Martin, Fleming-Smith Company, 1913, pp. 105-108.

13. Nichols, H. J.: Further Observations on Certain Features of Experimental Syphilis and Yaws in the Rabbit, J. Exper. Med. 14: 196-216, 1911.

14. Schamberg, J. F.; Kolmer, J. A., and Raiziss, G. W.: A Study of the Comparative Toxicity of the Various Preparations of Mercury, J. Cutan. Dis. 33: 819-839, 1915.

severe mercury nephritis irrespective of the salt administered or the route of injection. It was further observed that the toxicity of the mercurial salts is more or less directly proportionate to the amount of mercury administered.

Experimentally, arsphenamin is considerably less nephrotropic, as shown in an extensive series of experiments by Kolmer and Lucke.[15]

In accordance with our knowledge of the nephrotropic action of mercury is the view expressed by Wechselmann,[12] that mercury may render the kidneys more susceptible to the toxic effect of arsphenamin when used in combination. He therefore advises against the conjoined administration of these drugs. It is logical to assume that after intensive treatment with mercury and arsphenamin administration, the kidney may be sufficiently damaged to retard the elimination of arsenic, and in this way untoward reactions of arsphenamin may develop. It is conservative not to administer conjointly these drugs in the intensive treatment of syphilis.

It is apparent from the foregoing consideration how important it is to examine the urine frequently in the treatment of syphilis, particularly when mercury is administered.

THE WASSERMANN REACTION WITH URINE

Complement fixation tests with urine are exceedingly liable to yield falsely positive results, owing to the highly anticomplementary activity of urine. A constant and uniform amount cannot be used, as the anticomplementary activity varies with individual specimens. Heating in a water bath at 56 C. for thirty minutes removes only a slight amount of these anticomplementary substances, and tends to destroy any syphilis antibody that may be present. Age of the urine, that is, the time elapsing from voiding to the performance of the tests, greatly influences the anticomplementary activity; likewise, the temperature at which the urine is kept. When bacteria have developed and salts have been deposited in urine, the anticomplementary and hemolytic activities are augmented, and unless these are carefully studied in each specimen preliminary to the complement fixation test, may lead to error.

We have tested the urines of sixty cases of syphilis in the different stages of the disease, many presenting acute symptoms and being untreated. Every patient yielded a positive blood Wassermann reaction, the majority of the reactions being strongly positive with three different antigens.

Of the sixty cases, the urines of but two yielded positive reactions under technical conditions which we considered acceptable. These two cases were in the tertiary stage and free of symptoms.

As previously stated, the highly anticomplementary activity of urine may readily yield falsely positive results, especially if urine is used in the main tests in an amount just under the anticomplementary unit. Under these conditions the control may show complete hemolysis but the antigen tube slight inhibition of hemolysis, which may be interpreted as weakly positive fixation due to the presence of syphilis antibody. Exactly the same results may occur, however, with the urines of healthy nonsyphilitic persons, owing to the summation of the anticomplementary activities of antigen and urine in the antigen tube. To avoid this error we have titrated each urine unheated for its anticomplementary unit, and have used one-half this amount in the conduct of the complement fixation test. This appears to be the largest amount that may be safely employed; but even under these conditions a conservative attitude must be maintained in the interpretation of results. With many specimens the preliminary titrations and complement fixation tests were repeated after heating the urines in a water bath at 56 C. for half an hour.

Two methods were used: The first employed 1 c.c. of 1:20 guinea-pig complement in an antisheep hemolytic system and three antigens, including a cholesterolized alcoholic extract of heart, an alcoholic extract of syphilitic liver, and an exract of acetone-insoluble lipoids. Primary incubation was conducted in a water bath for one hour, the technic being that of our regular Wassermann test.[16]

A number of specimens were also tested with a technic using two units of complement and a primary incubation of eighteen hours at 6 to 8 C.[17]

The accompanying table summarizes the results observed with eight of a series of twenty-four specimens examined with this technic.

ANTICOMPLEMENTARY AND HEMOLYTIC ACTIVITY OF UNHEATED URINES OF SYPHILITIC PERSONS AND RESULTS OF WASSERMANN TESTS*

Blood Tests*			Urine Tests	
C. B. H.	S	A	Hemolytic	Anticomplementary
++++	++++	++++	0.4	0.5
++++	++++	++++	0.5	more than 0.5
++++	++++	++++	1.0	more than 0.5
0	0	0	more than 1.0	0.2
++++	+++	++	0.4	0.4
++++	++++	++++	1.0	more than 0.5
+	—	—	more than 1.0	more than 0.5
++++	++++	++++	more than 1.0	more than 0.5

*C. B. H. indicates cholesterolized antigen; S, alcoholic extract of syphilitic liver; A, acetone-insoluble lipoids. Complement fixation tests were negative throughout.

In the main tests each urine was used in graded amounts as high as 0.4 c.c. unless anticomplementary or hemolytic in lesser amounts, in which cases the maximum amount was about one-half the anticomplementary unit. In every instance the complement fixation tests were negative; when positive reactions occurred in this series of twenty-four cases we believed that inhibition of hemolysis was due to excessive amounts of urine and nonspecific factors, and not to the fixation of complement by syphilis antibody and lipoidal extracts.

Others, however, believe that the urine of syphilitics may yield true positive Wassermann reactions; Blumenthal and Wile [18] reported in 1908 their results of the Wassermann reaction with urine in forty-one cases of syphilis in various stages. Of this number, thirty-one gave a positive reaction in the blood and urine; in six cases the reaction was negative in the blood and urine; in three cases the reaction was positive in the blood and negative in the urine. In performing the

15. Kolmer, J. A., and Lucke, Baldwin: Summary of Experimental Studies on the Histopathologic Changes Produced by Arsphenamin and Neo-Arsphenamin, Arch. Dermat. & Syph. 2: 289-291 (Sept.) 1920.

16. Kolmer, J. A.: Infection, Immunity and Specific Therapy, Ed. 2, Philadelphia, W. B. Saunders Company, pp. 465-467.

17. Kolmer, J. A.: Technic of a Standardized Complement Fixation Test in Syphilis, Am. J. Syph., to be published.

18. Blumenthal, F., and Wile, U. J.: Komplementbindende Stoffe im Harn syphilitischer, Berl. klin. Wchnschr. 50: 1050-1051, 1908.

Wassermann test they used an alcoholic extract of syphilitic liver as antigen; the urine was used in amounts of 1 and 0.5 c.c., and the serum, 0.2 c.c.

Simon [19] more recently reported that he obtained a rather high percentage of positive Wassermann reactions in the urine of syphilitics. In some cases he obtained a positive reaction in the urine and negative reaction in the blood of the same patient. He is of the opinion that antisyphilitic treatment should be pursued until the urine gives a negative Wassermann reaction. He considers this just as important as the obtaining of a negative Wassermann reaction of the spinal fluid and the blood. In a second communication [20] he gives the method employed in performing the Wassermann reaction with urine. A syphilitic liver antigen and an anti-sheep hemolytic system was used. The amounts of the different reagents used were measured in drops. The amount of urine employed in performing the Wassermann test was 10 drops. No mention is made whether the specimen was heated or unheated. Simon points out that larger amounts than 10 drops are often anticomplementary, and that it is desirable to determine the anticomplementary dose of urine when used in performing the Wassermann reaction.

It is difficult for us to reconcile our results with these; but unless special precautions are taken against nonspecific complement fixation, it is exceedingly easy to misinterpret the results. We believe that it is the exception rather than the rule for the urines of syphilitic individuals to yield true positive Wassermann reactions.

THE URINE IN SYPHILITIC PAROXYSMAL HEMOGLOBINURIA

The occurrence of this condition in regions other than the tropics is due to or associated with congenital syphilis in the majority of cases.

In the syphilitic cases there is no differential feature in the urine to distinguish it from the cases arising from other causes. The condition is characterized by the appearance of hemoglobinuria usually following exposure to cold. In our case, in addition to this exciting cause, hemoglobinuria appeared after the administration of mercury and arsphenamin.

SPIROCHAETA PALLIDA IN SYPHILITIC URINE

Cases have been reported in which the presence of spirochetes was demonstrated in the urine. Dreyer and Toepfel [21] demonstrated the presence of the organism in the urine from a case of secondary syphilitic nephritis. In one of their examinations the urine was withdrawn by a catheter and the identification of the spirochete was confirmed by Schaudinn. A similar finding in the urine from a case of acute syphilitic nephritis has been reported by Hoffmann.[22]

Levy and Guile [23] examined the urine for the presence of *Spirochaeta pallida* of twenty-four men shortly before or after the beginning of the secondary stage of syphilis. The organism was found in the urine of only one of the men, and this only at the end of the first month after the development of the chancre.

19. Simon, C.: Note sur la recherche comparative de la réaction de Bordet-Wassermann dans le sang et dans les urines, Bull. de l'Acad. de méd. **83**: 73 (Jan. 20) 1920.

20. Simon, C., and Lebert, Marguerite: Technique de la réaction de Wassermann dans les urines, Bull. de la Soc. franç. de dermat. et de syph., 1920, pp. 117-119.

21. Dreyer and Toepfel: Spirochaete pallida im Urin bei Syphilitischer Nephritis, Dermat. Centralbl. **9**: 172-173, 1906.

22. Hoffmann, E.: Ueber akute syphilitische Nierenentzündung in der Frühperiode, Deutsch. med. Wchnschr. **39**: 353-356, 1913.

23. Levy and Guile: Spirochetes in the Urine in Syphilis, Bull. Soc. Méd. d. hôp. de Paris, **35**: 48, 1919.

DIAGNOSIS OF SYPHILIS FROM THE URINE

There is no urinary test by which a reliable diagnosis of syphilis can be made. Gray [24] reports results with this technic:

> To 6 c.c. of urine is added 1 c.c. of a solution of 1 gm. of iodin in chloroform or carbon tetrachlorid, and the mixture is thoroughly shaken. The chloroform settles to the bottom, and assumes either a pearly white color (negative reaction), or becomes pink or purple, which is probably a positive reaction. One c.c. of a 10 per cent. solution of phosphoric acid is then added, and the tube is again shaken. If the chloroform is cleared, the test is to be considered negative.[25]

In the performance of this test the urine must be a fresh specimen, and must be acid, with a specific gravity greater than 1.016. The sugar reaction must be negative, as the presence of sugar renders the reaction positive, even in the absence of syphilis. Recent ingestion of alcohol interferes with the result, as does polyuria from the use of diuretics, or excessive intake of water to allay prolonged thirst.

With this test Gray examined the urine of 200 patients, syphilitic and nonsyphilitic. Positive results were obtained in fifty-two cases which were known to be syphilitic. Five of these cases were in the primary stage. Five cases of glycosuria, five cases of polyuria of nervous origin, and ten cases of polyuria due to diuretics also gave positive reactions. Another series of thirty-five cases of definite or suspicious syphilis were examined. All of these cases were controlled by the blood Wassermann test, which was positive in twenty-four of the cases, while the urine test was positive in thirty-two. All cases were justly suspicious. In no case in which the Wassermann reaction was positive was the urine test negative.

The basis of this test, the substance in the urine which causes discoloration of the iodin, is not known.

SUMMARY

The urine was examined in forty-three cases of untreated primary syphilis, the duration of which was from a few days up to the time of cutaneous manifestations. Urinary abnormalities were present in three cases. The urine was examined in forty-six cases of untreated secondary syphilis. Urinary abnormalities were present in four cases. The positive cases all showed albumin and granular casts, excepting two in which casts were absent. In two cases, red blood cells were present. The albumin consisted of a trace, except that in two of the secondary cases a light cloud was present with many granular casts, and in one red blood cells. The urinary abnormalities disappeared after treatment with arsphenamin and mercury.

The urinary abnormalities in secondary syphilis are regarded as due in all probability to an invasion of the kidney by *Spirochaeta pallida* rather than due to syphilotoxins—which is the explanation usually given.

The clear blood serum and the urine, from the same patient, were mixed for the presence of precipitin or precipitogens in serum or urine.

The serums and urine of twenty acute untreated secondary cases were tested in this manner. The results were negative in all. Either the antibody is absent

24. Gray, C. D.: Urinary Test for Syphilis and Its Comparison with the Wassermann Reaction, Med. Rec. **89**: 821 (May 6) 1916.

25. The two solutions used in the commercial preparation known as the "Uri-na Test" for syphilis are apparently the same as these reagents—an iodin solution of chloroform and a dilute phosphoric acid solution. The discoloration constituting a positive or negative reaction in the "Uri-na Test" is of the same nature as is described above. This so-called "Uri-na Test" for syphilis proved unreliable in our experience.

in the serum, or the antigen from the urine or both may be absent, as indicated by the results.

Clinical and experimental observations show that mercury is considerably more nephrotropic than arsphenamin or neo-arsphenamin. In the conjoined intensive treatment of mercury and the arsenicals, the nephrotropic action of mercury may retard the elimination of arsenic and in this way cause untoward effects of arsenic. In view of this possibility, conjoined intensive treatment with mercury and the arsenical preparations is not advised.

The Wassermann reaction was performed with the urine of sixty patients with syphilis in the different stages of the disease, many presenting acute symptoms and being untreated. Every patient yielded a positive blood Wassermann reaction, the majority of reactions being strongly positive with three different antigens. Of the sixty cases, the urines in but two yielded positive reactions.

Complement fixation tests with urine are exceedingly liable to yield falsely positive results, owing to the highly anticomplementary activity of the urine. Anticomplementary activity varies with individual specimens. It is greater in old specimens than in fresh ones. Heating in a water bath at 56 C. for thirty minutes removes only a slight amount of the anticomplementary substances.

Falsely positive results with urine are particularly likely if the amount used in the main tests is just under the anticomplementary unit. Under these conditions the control may show complete hemolysis but the antigen tube slight inhibition of hemolysis, which may be interpreted as weakly positive fixation due to the presence of syphilis antibody.

Similar results may occur with the urine of healthy nonsyphilitic persons, owing to the summation of the anticomplementary activities of antigen and urine in the antigen tube.

In performing the Wassermann reaction with urine, each specimen unheated was titrated for its anticomplementary unit and one-half this amount used.

Two methods were used: The first employed 1 c.c. of 1:20 guinea-pig complement in an antisheep hemolytic system, and three antigens including a cholesterolized alcoholic extract of heart, an alcoholic extract of syphilitic liver and an extract of acetone-insoluble lipoids. Primary incubation was conducted in a water bath for one hour, the technic being that of our regular Wassermann test.

A number of specimens were alsto tested with a technic employing two units of complement and a primary incubation of eighteen hours at from 6 to 8 C.

Spirochaeta pallida may be found in the urine of syphilitics in the acute stage of the disease.

There is no characteristic feature in the urine of paroxysmal hemoglobinuria of syphilitic origin which serves to differentiate it from the same condition due to other causes.

Results with urinary tests for syphilis were of no value as a means to the diagnosis of syphilis.

To Render Filtrable Viruses Visible.—A Fontana and G. Sangiorgi, professors at the University of Turin, announce that by treating the virus with some substance which clumps the infinitesimal particles, and then staining them with the Fontana-Tribondeau ammonia-silver nitrate method they show up well under the microscope. They thus obtained excellent views of granular bodies in vaccine virus and in rabies virus, according to a review in the *Riforma Medica* of their publication in *Pathologica* **11**:257, 1919.

Clinical Notes, Suggestions, and New Instruments

CASE OF PYLORIC ULCER COMPLICATED BY TAENIA SAGINATA, WHICH WAS VOMITED, AND BY TAENIA SOLIUM AND STRONGYLOIDES INTESTINALIS

R. ALLYN MOSER, A.B., M.D., OMAHA

History.—K. C. K., a man, aged 37, Korean, photographer, admitted to the service of Dr. W. O. Bridges at the Nebraska Methodist Hospital, Oct. 18, 1916, came to the United States nine years before from Korea. Previous to coming to Nebraska he had spent about five years on the Pacific Coast. He did not know what childhood diseases he had had, excepting smallpox when a boy. He denied all venereal infection. In 1912 he began having spells of general abdominal distress, with belching, frequent nausea and occasional vomiting. He stated that when his stomach was empty the distress was more severe and was always relieved by eating. No particular food caused distress, and he had never been jaundiced. These symptoms continued until 1914, when the distress became more constant and he sought relief. At this time a colectomy was performed by a competent surgeon. After he recovered from the operation his bowels moved frequently, generally four or five times daily, and the distress was not relieved. Constant abdominal distress with distention and belching had been present ever since the operation, more severe immediately after eating, and always relieved by bowel movements. Discomfort was so severe at times that he had been given morphin hypodermically.

October 9, the patient began vomiting. He was unable to hold anything, and had lost 10 pounds in the eight days before entering the hospital. The bowels moved four or five times daily. He had never noticed blood or mucus in the stools. He had no urinary disturbance or circulatory irregularities.

Physical Examination.—The patient was rather emaciated. On the abdomen was a long median scar from the operation; distention and marked tenderness on pressure were general. The muscles were soft and flabby; the skin, dry and smooth. Other findings were normal.

Gastric analysis revealed: free hydrochloric acid, 22; total acidity, 38; some mucus. There was no occult blood. Blood court revealed: hemoglobin, 80 per cent.; red blood cells, 4,400,000; white blood cells, 6,800; polymorphonuclears, 46 per cent.; small lymphocytes, 26 per cent.; largely lymphocytes, 20 per cent.; eosinophils, 8 per cent. The stool was foul, semisolid and greenish. There was no occult blood. There were many larvae of *Strongyloides intestinalis.*

Treatment and Results.—The patient was put on a soft and liquid diet, and was given hot abdominal packs after each meal. For two days he felt better, and was taking care of his food. Next day he was seized with intense epigastric pain, which lasted for several hours, when he vomited 11 feet of *Taenia saginata.* He was then given a course of treatment for *Taenia,* after which segments in various lengths and two distinct heads were found, those of *T. saginata* and *T. solium.*

After this he felt well and apparently was quickly recovering from all his symptoms, when on October 31 he again had severe epigastric pains after a light breakfast. An Ewald test meal revealed free hydrochloric acid 20, and a total acidity of 80, with no occult blood. The stools still contained larvae of *Strongyloides intestinalis.* The gastric distress continued and was relieved only by gastric lavage, when large amounts of retained fluids were aspirated. A diagnosis of pyloric ulcer was then made, and for several days all feeding by mouth was discontinued. November 4, the patient was put on a modified Sippy treatment, which gave the patient only slight and temporary relief, for as soon as more solid food was added to his diet the distress returned. A gastro-enterostomy was then advised. The surgeon's report was pyloric spasm, gastric distention, pyloric ulcer and gastro-intestinal adhesions. He made an excellent recovery from the operation, and went home, Dec. 11, 1916.

May 4, 1920, he returned to the office. He was feeling fairly well and had gained weight, but was complaining of some

distress in the left upper abdominal quadrant. No definite points of tenderness were found except over the operative abdominal scars. Gastric analysis was: free hydrochloric acid, absent; total acidity, 15; lactic acid, absent. A roentgenogram of the stomach and duodenum revealed the stomach empty in six hours; peristalsis, active; the greater curve 1½ inches below the umbilicus, and no evidence of ulcer or carcinoma. Food was passing through the pylorus and the gastro-enterostomy opening, more through the pylorus. A specimen of stool still contained larvae of *Strongyloides intestinalis*.

COMMENT

This case has several points of interest. What relation had *Taenia saginata* to the pyloric ulcer? Evidently, since the worm was vomited it had taken up its position near the pylorus, and was at least partially the cause of the first pyloric spasm. The fact that there was improvement after the expulsion of the worms, and then again a pyloric spasm would seem to indicate that the worms were an exciting factor of the ulcer. After a short latent period the ulcer irritation began again, this time being the result of increased feedings.

Vomiting of *Taenia* is as rare as is a double infestation of the worm.

A REFINEMENT IN THE RADICAL OPERATION FOR TRIGEMINAL NEURALGIA

CHARLES H. FRAZIER, M.D., Sc.D., PHILADELPHIA

In every respect the results of the radical operation for trigeminal neuralgia are most satisfactory. Since Spiller, in 1901, first proposed section of the sensory root as a substitute for excision of the gasserian ganglion, his operation has gradually become the accepted procedure. One of the advantages claimed for his operation—a reduction in the mortality—has also been realized. In 1895 the mortality as recorded in Tiffany's tables was 22.5 per cent.; in 1909, in a series of 200 cases that I compiled from four surgeons with the largest experience in trigeminal operations, the mortality rate was 3.5 per cent. Today the mortality is approaching the zero mark. With the exception of one death from apoplexy of a patient in the convalescent stage, there have been none in my clinic in the last 157 operations (0.6 per cent.). The risk of the operation may be said to be a negligible factor, and the complete relief from pain may be offered in full justification of the sensory root operation.

These are the major considerations. Of minor consideration is the "cosmetics." In times past the motor root has been sacrificed with the sensory root, and there followed inevitably atrophy of the temporal, masseter and pterygoid muscles. So far as it affected movements of the jaw it was a matter of inconvenience; but the atrophy of the temporal muscle left a depression above the zygoma that was quite noticeable and prevented what otherwise might have been regarded as a perfect cosmetic result, since the incision was well concealed within the hair line. To meet this objection some surgeons went so far as to resect the zygoma.

A year ago I took up this motor root problem and found a solution.[1] In the past the motor root was often sacrificed because the surgeon was afraid he might be leaving a fasciculus of the sensory root with all its unforunate possibilities. But with the use of the electrode the motor root when exposed can positively be identified as motor by observing the temporal muscle contact.

When the sensory root is adequately exposed, in the course of the operation, it is elevated from its bed with a blunt instrument. Usually the motor root may be seen in contact with the skull, traversing the space behind the root and disappearing behind the ganglion. If recognized or suspected, the electrode is applied; and should it prove to be the motor root, the fibers of the temporal muscle, exposed to view in the wound, will contract. Sometimes at this preliminary inspection the motor root will not be seen because, cleaving to the sensory root, it has been lifted up by the instrument with the sensory root. Under these circumstances I make segmental sections of the sensory root, beginning with the outer fasciculi, and search for the motor root after each section. Usually when half of the sensory root has been divided, one can recognize the motor root as it passes behind the ganglion. But to confirm the observation, the electrode is used. If these directions are followed, the motor root may be conserved in the majority of instances. It has escaped me occasionally, but with continued effort and experience, I believe it will be possible to save the root in every instance.

With this refinement in technic the radical operation might be said to be beyond criticism. Symmetry of the face is conserved, as there is no atrophy of the temporal muscle; there is no deviation of the jaw, since the pterygoid muscles are intact; and mastication is in no way interfered with.

1724 Spruce Street.

1. The use of the electrode was suggested to me during the war by Dr. C. C. Coleman.

A CASE OF TORSION OF THE OMENTUM

C. E. HAWKES, A.B., M.D., PROVIDENCE, R. I.

History.—T. R., a French-Canadian, aged 53, blacksmith, entered the Rhode Island Hospital, June 15, 1920, because of pain in the abdomen, especially the right lower quadrant. The family history was negative. The patient had had a right inguinal hernia for seventeen years. He had always been able to reduce it, and it had never given him any trouble. He was taken acutely ill, June 12, while walking. The pain was located in the right lower quadrant of the abdomen, and it seemed to be independent of the old rupture, for the patient was able to push the latter back. He had been in bed since the evening of his attack, and had vomited several times during the preceding two days. He took a laxative with good result, but had taken no nourishment since the onset of his trouble.

Physical Examination.—The patient was well developed and well nourished. He appeared acutely ill and toxic. He was rational. The head and neck were negative, the lungs resonant and vesicular throughout. The heart, not enlarged, was regular in rhythm and clear, with no murmurs. The abdomen was slightly distended, with fairly firm wall all over, with definite rigidity over the lower right rectus muscle. There was marked tenderness in the lower right quadrant, with a palpable tumor mass, dull on percussion. There was a small right inguinal hernia, easily reducible and apparently made up of omentum. The extremities were negative. The patient was operated on about one hour after admission to the hospital.

Operation and Result.—A lower right rectus incision was made. A slight amount of free, turbid fluid escaped when the peritoneum was opened. The mass in the lower quadrant proved to be omentum, adherent to the inguinal canal and hernial sac. On this portion as an axis, the omentum had taken several turns, until a constriction had occurred 6 or 8 inches proximal to the abdominal ring. The distal part, about the size of two fists, had become gangrenous, and most of it was adherent to the floor of the pelvis, posterior to the bladder. Its dark color, friability and nodular appearance were very suggestive, at first glance, of a soft malignant growth. On further examination, it was found to be part of the rest of the omentum. The gangrenous mass was carefully dissected from the pelvis, and that portion anchored to the inguinal canal was tied and cut away. After being thus freed from its attachments it was all excised just back of the constricted ring. A search was now made for the appendix, and a small stub about 1 inch long was found adherent to the cecum. It had apparently been amputated at its middle by bands of omentum. It was excised, close to the cecum, and the stump turned in. A cigaret drain was inserted to the pelvis. The abdominal wound was closed in layers. The patient made a good recovery from the ether, with very little vomiting. The pelvis drain was removed at the end of forty-eight hours. There was virtually no drainage.

June 23, the stitches were removed.

June 29, the patient was placed on back rest.

July 3, the patient was walking about the ward. He refused to have the hernia repaired. He was discharged from the hospital.

355 Thayer Street.

Special Articles

BIOLOGIC THERAPY *

(Continued from page 37)

IV. SERUM TREATMENT OF BACILLARY DYSENTERY †

SIMON FLEXNER, M.D.
NEW YORK

Bacillary dysentery occurs in all countries, but it is more frequent in tropical than in temperate climates and prevails little or much according to the state of sanitation of the region. The dysenteric bacilli are taken into the stomach with food or drink to which they have gained access, directly or indirectly, from the feces of cases of bacillary dysentery or from carriers—convalescent or healthy—of the bacilli. In mode of communication, bacillary dysentery resembles typhoid fever; but it is not preventable by vaccination as is the latter disease, because of the severe local reaction that the injection of killed cultures of dysenteric bacilli sets up.

VARIETIES

Two groups of dysenteric bacilli exist. The first was discovered by Shiga in Japan and bears his name, the second by Flexner in Manila. All Shiga bacilli are identical, but there are several kinds of Flexner bacilli, distinguished from one another by minor cultural and immunity reactions. The distinction between the Shiga and Flexner groups of bacilli is, however, far greater; thus, while all the Flexner group react immunologically more or less to a serum prepared from one of its members, this immune serum has little effect on Shiga bacilli, and vice versa. In one essential respect all the dysenteric bacilli agree, namely, in inducing in man the symptoms and intestinal lesions of dysentery, which sometimes are mild and sometimes severe. Both groups of bacilli are alike in this action, but infection on the whole with the Shiga bacilli tends to be more serious than infection with the Flexner group of bacilli.

TOXINS

The Shiga bacilli yield two toxins: one soluble, which is quickly passed into the surrounding medium, so-called exotoxin, and one more closely fixed to the cell protoplasm, so-called endotoxin. When both toxins are injected into the rabbit, the first attacks the central nervous system and the second attacks the intestinal tract. The Flexner bacilli yield only an endotoxin.

ANTISERUMS

When animals are injected with cultures of the Shiga bacillus, an antiserum is obtained which contains antibodies both for the exotoxin and for the endotoxin. This antiserum is neutralizing for the poisons of the Shiga bacilli, and protective against infection with the living bacilli. When animals are injected with cultures of the Flexner group of bacilli, an antiserum is obtained neutralizing to the endotoxins and protective against infection with the bacilli themselves.

The horse is subject to immunization both with the Shiga and with the Flexner group of bacilli and the serum yielded constitutes the therapeutic antidysentery serum. Because of the differences existing between the Shiga and Flexner bacilli, it is usual to immunize horses separately to the two kinds. The serum obtained may be applied separately in the treatment of dysenteries induced by the Shiga or Flexner bacilli, respectively, as determined by precise bacteriologic examination, or after mixing together in cases of bacillary dysentery in which the particular infecting bacillus has not been thus determined. Such a mixed serum yields the so-called polyvalent antidysentery serum which, if potent, should contain antibodies for all the toxins contained in the Shiga and Flexner groups of bacilli.

SERUM TREATMENT

Many reports of the serum treatment of bacillary dysentery have now been made, and they are remarkably concordant in attesting its value. Like all other acute infectious diseases subject to serum treatment, the earlier the antidysentery serum has been applied in the course of the attack, the more striking and convincing the result. The precautions to be observed in the administration of the serum are identical with those practiced with other antiserums, and consist of cleanliness of operator and patient, sterility of syringe and other apparatus employed, and protection against hypersensibility (anaphylactic reaction).

The antiserum is, as a rule, injected subcutaneously, but may be injected intravenously when indicated in very severe cases. The dose varies with the age of the patient and the severity of the symptoms. The average dose for an adult is 20 c.c., for a young child 10 c.c. But in very severe cases the dose, given intravenously, ranges from 50 to 100 c.c.

In cases of ordinary severity, a single subcutaneous dose may be followed by such marked alleviation of the symptoms as not to call for repetition. In other and severer cases, the dose may need to be repeated in from twelve to twenty-four hours, and again in forty-eight hours.

The effects of the injection of the serum tend to appear promptly. They consist first in the amelioration, often within a few hours, of the nervous symptoms and the general prostration. Usually within twenty-four hours the tenesmus and colic disappear and the stools become markedly reduced in number. Along with this improvement there goes diminution in the blood and mucus content of the discharges, coincident with which there is a return of their feculent character. According to the severity of the attack, the stools return to normal in from two to five days.

Acute cases of bacillary dysentery are especially subject to the serum treatment, but cases in their second to third week may still be favorably influenced, as may also relapses in the course of convalescence from acute attacks. On the other hand, chronic cases and the recrudescences in the course of chronic dysentery, even if originally induced by the dysentery bacilli, do not as a rule respond to the serum.

It should be added that the employment of the serum does not contraindicate the usual eliminative and dietetic forms of treatment.

* This is the second instalment of a series of articles dealing with serums, vaccines and nonspecific therapy.

† From the Laboratories of the Rockefeller Institute for Medical Research.

MORTALITY

The mortality from bacillary dysentery varies widely. As already stated, the Shiga bacillus infections tend to be severer than the Flexner group infections, but this relation may be reversed. Different outbreaks and epidemics show fatalities ranging from 5 to 50 per cent. Certain comparisons have been instituted between serum treatment cases and cases not so treated. In general, it may be stated that mild outbreaks in which the ordinary mortality is from 10 to 15 per cent. may give a fatality of from 1 to 2 per cent. under the serum treatment, and the severer epidemics in which ordinarily the mortality range is wider, reaching even 50 per cent., may under the serum treatment fall to about 10 per cent.

SERUM PROPHYLAXIS

The polyvalent antidysentery serum may be used to prevent infection with dysenteric bacilli. Perhaps the especial circumstances under which this mode of use is indicated is in institutional outbreaks of the disease. The usual prophylactic dose is 5 c.c., injected subcutaneously. It is important, however, to bear in mind that the protection thus afforded endures only twelve to fourteen days.

SERUM DISEASE

The administration of antidysentery serum, as of all other serums prepared in the horse, may be followed by the symptoms of serum disease. These symptoms, while sometimes producing discomfort, are not serious and are to be combated in the manner followed in other and more familiar instances (as diphtheria) in which they arise.

V. THE USE OF ANTITOXIN IN THE TREATMENT OF DIPHTHERIA

WILLIAM H. PARK, M.D.
NEW YORK

Antitoxin as used is prepared by a precipitation of the antitoxin and "soluble" globulin from the serums of immunized horses. By this process a considerable portion of the serum proteins are eliminated, while the antitoxin properties are retained.

The local lesions and the constitutional effects of uncomplicated diphtheria are almost wholly due to the action of the specific diphtheria toxin. It is true that there are also endotoxins; but these are much less poisonous and probably do slight damage except when the lungs are invaded. The complications of diphtheria, for example, pneumonia, are frequently due to other bacteria, such as the pneumococci and streptococci.

The treatment of early uncomplicated diphtheria is therefore largely directed to the neutralization of the toxin by antitoxin. When the disease has existed for some days or when complications, such as pneumonia due to other micro-organisms, have arisen, the use of antitoxin, while still indispensable, is no longer equally effective, as it has no power whatever to neutralize other poisons or beneficially to affect cells already injured. Fortunately, the diphtheria toxin requires considerable time to penetrate the deeper tissues and pass by the lymph stream to the blood and from the capillaries to the tissues of the body.

In uncomplicated diphtheria the patient recovers, if the toxin is neutralized by the antitoxin before it has caused irreparable injury. The proper administration of antitoxin requires, therefore, that it be given so as to reach the toxin in sufficient amount at the earliest practical moment.

Antitoxin, unlike most remedies, is slowly absorbed into the general blood stream from the tissues when given subcutaneously. This characteristic influences the methods used in administering it. Thus, if a child weighing 25 pounds receives 10,000 units subcutaneously, there will be a gradual accumulation of antitoxin in the blood which will reach about 1.5 units in each cubic centimeter at the end of twelve hours. An intramuscular injection is absorbed about three times as rapidly. An intravenous injection makes the whole amount of antitoxin immediately available. The potency of the blood would amount to about twelve units per cubic centimeter. As it is necessary for antitoxin to enter the blood stream before it passes to the tissues that are in contact with the toxin, it is evident that the intravenous method has an immense advantage. The dosage of antitoxin in a patient cannot be determined as in a test tube by the amount of toxin present. In no case is sufficient toxin elaborated to require more than 100 units of antitoxin to bind it completely. Immensely larger doses are properly given so as to

AMOUNT OF ANTITOXIN IN THE TREATMENT OF A CASE

	Mild Cases Units	Early Moderate Units	Late Moderate and Early Severe* Units	Severe and Malignant* Units
Infants, 10 to 30 lbs. in weight, under 2 yrs..	2,000 to 3,000	3,000 to 5,000	5,000 to 10,000	7,500 to 10,000
Children, 30 to 90 lbs. in weight, under 15 yrs..	3,000 to 4,000	4,000 to 10,000	10,000 to 15,000	10,000 to 20,000
Adults, 90 lbs. and over in weight	3,000 to 5,000	5,000 to 10,000	10,000 to 20,000	20,000 to 50,000
Method of administration advised	Intramuscular	Intramuscular	Intravenous	Intravenous

* When given intravenously, the smaller amounts stated.

reach the free toxin everywhere quickly and in adequate amount. Antitoxin remains in the body for several days. When given intramuscularly or subcutaneously, the blood has its highest antitoxin value from twenty-four to seventy-two hours after the antitoxin globulin has been injected into the tissues. When given intravenously, the blood's greatest antitoxin content is at the moment of injection. Thus, in the case of the child of 25 pounds, the blood would contain at the end of forty-eight hours, if given a single dose of 10,000 units subcutaneously or intramuscularly, about four units per cubic centimeter, and if given intravenously, about eight units. This persistence of the antitoxin in the blood for a number of days is not grasped by most physicians. On this misunderstanding is due the use of the multiple dose. Observations extending over years in the hospitals of New York City have added clinical to experimental evidence that a single dose of sufficient quantity is all that is required in any case. If the first dose is sufficient, later injections, though not harmful, are useless. An insufficient first dose, however, cannot be wholly compensated for by later injections. Founded on the foregoing considerations,

the directions for the use of antitoxin may be condensed as in the accompanying table.

Cases of laryngeal diphtheria, moderate cases still active and seen late at the time of the first injection, and moderate cases of diphtheria occurring as a complication of the exanthems should be classified and treated as "severe" cases.

In all cases a single dose of the proper amount, as indicated in the schedule, is recommended.

Before the remedy is administered, the skin should be sterilized at the point of injection with tincture of iodin or other disinfectant. The syringe should be thoroughly sterilized. It is better not to employ massage over the point of injection, when the antitoxin is given intramuscularly or subcutaneously.

In cases of any severity in which diphtheria is suspected, and in cases of croup, it is far better to administer the remedy at once, making a culture at the same time, than to delay the treatment until a diagnosis has been verified by bacteriologic examination. One large dose given early is far more efficacious than the same amount in divided doses. Antitoxin for intravenous injection should be highly potent and show no turbidity. It must be warmed to the body temperature and given very gradually. One minute should be allowed for the injection of each cubic centimeter.

IMMUNIZATION

When children or adults have been exposed to diphtheria, they may be protected from the disease by the subcutaneous administration of from 500 to 1,000 units, the smaller dose being sufficient for infants and young children. The protection does not last longer than from two to four weeks. The injection should be repeated if danger of infection persists longer than three weeks. Before immunizing members of a household exposed to diphtheria, it is often advisable to determine by the Schick test whether they have natural immunity and are therefore not in danger of contracting the disease. Three toxin-antitoxin injections produce permanent immunity in about 90 per cent. of the nonimmunes.

DELETERIOUS EFFECTS OF ANTITOXIN GLOBULIN

Deleterious effects of antitoxin globulin are probably not due to the antitoxin as such but to the accompanying globulin. An intravenous injection may be followed by a chill and an accompanying rise of temperature which lasts for about two hours. Rather frequently, from two to seven days after the antitoxin injection an urticarial rash develops, and with this there may be a slight rise in temperature. Much more rarely, scarlatiniform or other types of rashes with a rise of several degrees of temperature and other constitutional disturbances occurs. Complete recovery always ensues. Entirely distinct from these slight effects are occasional severe disturbances. A few minutes after an injection about one in every thousand persons develops a rapid and feeble pulse, nausea and a feeling of suffocation. With stimulation and, if necessary, artificial respiration, recovery soon ensues. Those who frequently suffer from attacks of asthma are liable to an attack after an antitoxin injection. There have also been recorded a few deaths. These have occurred chiefly and perhaps wholly in cases of status lymphaticus. About one death has occurred for every 70,000 persons injected, and these deaths, with possibly two exceptions, have followed the first serum injection. The fear of repeating a serum injection because of having sensitized the patient is almost wholly groundless. There need be no fear in giving a second intramuscular or subcutaneous injection to any person who has not suffered severely from the first. The only difference in the effects of the two injections will be that the serum reaction will follow almost immediately the second injection. If the second injection is given intravenously after a considerable lapse of time, it should be given even more slowly than the first. If it is necessary to give antitoxin to persons who are liable to attacks of asthma, it is well to give it in divided doses. One-tenth c.c. of serum every fifteen minutes will usually be borne without disagreeable effects.

VI. THE SERUM TREATMENT OF ACUTE POLIOMYELITIS *

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NEW YORK

A definite and enduring immunity is established by an acute attack of poliomyelitis both in the human being and in the experimentally infected monkey, and in both instances the convalescent serum contains substances neutralizing the poliomyelitic virus. Flexner and Lewis [1] were able by the intraspinal injection of convalescent serum both from monkey and from man to delay and in some cases prevent altogether the onset of the disease in monkeys which had received intracerebral injections of the virus. Netter and his associates [2] have used human convalescent serum injected intraspinally in the treatment of human cases, with some degree of success. More recently, Amoss and Chesney [3] employed combined intraspinal and intravenous injections of relatively large amounts of the convalescent serum with still more promising results.

THE SERUM

Attempts to produce an immune serum for the virus of poliomyelitis in animals other than the monkey have thus far not been successful. At present persons who have recovered from an acute attack of poliomyelitis constitute the only available source of serum for treatment. The collection and testing of serum require considerable time, so that they should be undertaken as early as possible after the appearance of epidemic poliomyelitis in a region. The treatment is scarcely adapted to the sporadic disease.

Netter has used as a source of the therapeutic serum persons who have had an attack as remote as thirty years, although he states that the best results were obtained with serum from persons who had passed through an attack of the disease more recently—from six weeks to two years previously. If the serum is

* From the Laboratories of the Rockefeller Institute for Medical Research.

1. Flexner, Simon, and Lewis, P. A.: Experimental Poliomyelitis in Monkeys, J. A. M. A. **54**: 1780 (May 28) 1910; **55**: 662 (Aug. 20) 1910.

2. Netter, A.: Bull. de l'Acad. de méd., Series 3, **74**: 403, 1915. Netter, A., and Salanier, M.: Bull. et mém. Soc. méd. d. hôp. de Paris, Series 3, **40**: 299, 1916.

3. Amoss, H. L., and Chesney, A. M.: J. Exper. Med. **25**: 581 (April) 1917.

obtained from a patient who has passed the febrile stage and is in good physical condition, there appears to be no danger of transfer of the virus.

COLLECTION OF THE SERUM

Before blood is taken for the collection of serum, the donor is given a physical examination, and a Wassermann test is made with the blood. The amount of blood which may be withdrawn varies with the body weight and condition of health, and is in general from 500 to 700 c.c. in the case of an adult, and from 200 to 250 c.c. with the average child of 10 years. The serum separated from the clotted blood is inactivated at 55 C. for one hour and tested for sterility, then transferred to small sterile bottles. For general use outside the hospital it is preserved with 0.2 per cent. tricresol. The bottled serum, which should be free of hemoglobin, fat or particulate matter, is kept in the icebox until used. Serum from different individuals may be mixed, or "pooled."

DOSAGE AND INTRASPINAL ADMINISTRATION

The administration of serum after the febrile period has passed is of doubtful value; hence it is desirable to make the diagnosis early in the attack; in some instances this can be done before the onset of any paralysis. During epidemics a microscope should be carried to the bedside, and while the needle is still in place during lumbar puncture the fluid is examined for cells and globulin. If the diagnosis of poliomyelitis is regarded as positive, the intraspinal injection of serum may be given immediately through the same needle, without a second lumbar puncture. The amount injected varies according to the amount of spinal fluid withdrawn and the estimated pressure. With the patient in the horizontal position, the fluid is withdrawn until only four or five drops per minute continue to escape. The amount of fluid in cubic centimeters less 10 is the amount of serum to be injected by the gravity method; however, if the pressure of the fluid is very great at the moment of lumbar puncture, correspondingly less should be given. The serum should be warmed to 38 C. before injection.

INTRAVENOUS INJECTION

After the intraspinal injection is accomplished, warmed serum (38 C.) is injected into one of the arm veins or, in small children, into the jugular vein. The amount to be given ranges from 40 c.c. in children up to 2 years to correspondingly larger amounts in older children; a child of average weight at 9 years should receive from 80 to 100 c.c. While it is inadvisable to use serum even slightly tinged with hemoglobin intraspinally or intravenously, it may be given subcutaneously. Deeply colored serum should be discarded.

The intraspinal and intravenous injections may be repeated after twenty-four hours if the temperature has not approached normal.

SUMMARY

Such definitely promising therapeutic results as have been obtained with serum in monkeys suffering from experimental poliomyelitis and in man suffering from the epidemic disease are limited strictly to the employment of convalescent serum, in man from recovered human patients, administered either intraspinally alone, or, as seems better, both intraspinally and intravenously at the same time, early in the course of the disease and during the febrile period.

VII. ANTIPNEUMOCOCCUS SERUM

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NEW YORK

Pneumococci have been divided on the basis of their immunologic reactions into four types. All of the pneumococci of each of the three types, named Types I, II and III, have immunologic properties very specific for each type. An immune serum that will protect mice against lethal doses of any strain of pneumococcus of one of these types will protect mice against all other strains of the same type, but it will not protect mice against lethal doses of any strain of any other type. Consequently, in any case of pneumonia due to pneumococci of one of these types an immune serum can have therapeutic value only if the serum has been prepared by the immunization of horses against the particular type of pneumococcus which is the inciting agent in that case. The various strains of pneumococci of Type IV possess a high degree of individual specificity, so that it would not be practical to prepare or employ in treatment an immune serum effective against pneumococci of this type. For certain reasons it is not probable that an immune serum against Type III pneumococci would be therapeutically effective in man. So far as Type II serum is concerned, clinical studies have shown that it is not possible at present to obtain sufficiently favorable results to justify the routine employment of this serum. On the other hand, we now have evidence that the serum of horses immunized to Type I pneumococci is of great value in the treatment of cases of pneumonia due to Type I pneumococci.

In view of the therapeutic efficacy of Type I serum, it is important that in every case of lobar pneumonia the type of pneumococcus concerned should be determined at once. The so-called mouse method is the best for determining the type.

The serum to be used is prepared by the repeated injection of horses, first with dead, then with living cultures of pneumococci, Type I. The serum should be of such potency that 0.2 c.c. of the serum will regularly protect a mouse against at least 0.1 c.c. of an eighteen hour broth culture of pneumococcus, Type I, of such virulence that 0.000001 c.c. of the culture alone will kill a mouse of 20 gm. weight within forty-eight hours.

In all cases of acute lobar pneumonia due to pneumococcus Type I, immune serum is indicated, and the treatment should be undertaken as early in the disease as possible after the type has been determined. The serum is injected intravenously.

The amount of serum to be injected at the first dose is from 90 to 100 c.c., and this dose should be repeated every eight hours until the fall of temperature and amelioration of symptoms indicate that the infection has been overcome. The serum injected should be at body temperature, and it should be injected very slowly. The total amount required in the average case is from 200 to 300 c.c., though in severe cases, treated late in the disease, it may be necessary to employ much larger amounts, even as much as 1,000 c.c.

The effectiveness of the serum is indicated by the following facts:

1. The blood of the patient becomes sterile following the injection of the serum.

2. The progression of the local lesion in the lung is arrested.

3. The subjective and objective symptoms of the disease are ameliorated.

4. The mortality of the disease is reduced.

The mortality rate in cases of lobar pneumonia due to pneumococci, Type I, not treated with serum has been shown to be from 25 to 30 per cent. or higher. On the other hand, among 195 cases treated with serum in the Hospital of the Rockefeller Institute, only eighteen deaths have occurred, a case mortality rate of but 9.2 per cent. Reports of 300 additional cases treated with serum have been collected from the literature, making a total of 495 cases. The case mortality rate in these 495 cases has been 10.5 per cent.

SERUM REACTIONS

Following the injection of the large amounts of serum, certain untoward effects may occur.

1. *Anaphylactic Reaction.*—This type of reaction may also occur following the injection of foreign serum by any method or for any purpose. It may be guarded against by proper methods.

2. *So-Called Thermal Reaction.*—This may occur from twenty minutes to an hour following the administration of the serum. It is probably identical with the reaction that may occur following the parenteral injection of any kind of foreign protein. It is usually not serious, but is not believed to have any therapeutic value and should be prevented so far as possible.

3. *Serum Disease.*—Mild symptoms of serum disease appear in about half the treated cases, severe attacks only rarely, or in not more than 10 per cent. of the cases.

DESENSITIZATION

Certain individuals are especially subject to anaphylactic reactions; they are asthmatics and patients who have previously received therapeutic or prophylactic injections of serum. In order to determine whether this hypersensitive state exists, it is well to inject intradermally 0.2 c.c. of a 1:10 dilution of horse serum with a control injection of an equal amount of physiologic sodium chlorid solution. If sensitiveness is present, usually within five minutes a genuine urticarial wheal develops at the site of injection of the serum, and this increases slowly in size to that of a half dollar; the wheal in turn is surrounded by a larger area of erythema.

In all patients before the administration of therapeutic doses of antipneumococcus serum, it is also well to inject from 0.5 to 1 c.c. of serum subcutaneously a few hours before the intravenous injection. This will serve to overcome slight degrees of hypersensitiveness. If, however, it is found that marked hypersensitiveness exists, it is necessary to resort to slow desensitization. This is effected by injecting small amounts of the serum, at first subcutaneously, beginning with 0.025 c.c. and doubling the dose every half hour until 1 c.c. is given; then injecting 0.1 c.c. intravenously and doubling the dose every half hour until 25 c.c. can be given without untoward reaction. Four hours later, 50 c.c. may be given; and finally after an interval of eight hours, treatment may be continued in the usual manner. Fortunately, it is rarely necessary to resort to this tedious procedure. In all patients it is well to give the first part of the first intravenous injection very slowly; this will serve as a desensitizing measure as well as an added means of detecting hypersensitiveness. In order to combat promptly any severe anaphylactic symptoms, the physician should be prepared to inject 0.6 c.c. (10 minims) of 1:1,000 suprarenal extract (epinephrin).

VIII. USE OF TETANUS ANTITOXIN IN PREVENTION AND TREATMENT OF TETANUS

MATTHIAS NICOLL, Jr., M.D.
State Deputy Commissioner of Health
ALBANY, N. Y.

The fulminating type of tetanus which occurred so frequently during the early months of the World War, when antitoxin for immunization was difficult to obtain, is not so commonly encountered in civil life, in which the symptoms of the disease are likely to develop more gradually and after an incubation period of a week or longer.

It cannot be stated that experience gained during the war has modified to any extent the best medical opinion as to the dosage and methods of administration of antitoxin, but it has emphasized the immense value of antitoxin in the prevention of tetanus and demonstrated the importance of freely cutting away all dead tissue within and about extensively lacerated and contused wounds (*débridement* of the French).

PREVENTIVE TREATMENT

In every case of open wound accompanied by laceration and crushing of tissue; of punctured wounds made by iron nails, knives, sea shells, large splinters, etc., which cannot be thoroughly sterilized; bullet wounds, blank cartridge wounds, or any wound into which city dirt or garden soil has been visibly or probably ground, an immunizing dose of tetanus antitoxin of 1,000 units should be given subcutaneously (500 units in the case of young children), the wound at the same time receiving thorough surgical treatment. In those cases in which the wound continues to slough or show signs of infection, and in gunshot and deep seated wounds in which the condition of the wound tract cannot be definitely determined, the dose should be repeated within a week, and in certain cases again repeated after the same interval.

CURATIVE TREATMENT

The value of antitoxin in the treatment of tetanus depends directly on the promptness and method of administration. Every hour lost after the development of symptoms adds to the gravity of the prognosis. The subcutaneous method of administration is of extremely doubtful value; the intravenous method, even when massive doses are thus given, has proved very disappointing, while the value of the intraspinal method has been demonstrated beyond question.[1]

1. Nicoll, Matthias, Jr.: Intraspinal Administration of Antitoxin in Tetanus, J. A. M. A. 64:1982 (June 12) 1915. Park, W. H., and Nicoll, Matthias, Jr.: Experiments on the Curative Value of the Intraspinal Administration of Tetanus Antitoxin, J. A. M. A. 63:235 (July 18) 1914.

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Every patient, especially with the history of a wound, however slight, but also without any such obtainable history, who presents the symptoms of a stiff jaw, coming on suddenly with tenseness of the masseter muscles on attempting to open the mouth, or with tonic spasm of the abdominal muscles causing a boardlike resistance to the touch, unless such symptoms can be definitely accounted for otherwise than by tetanus infection, should receive as soon as possible an intraspinal dose of tetanus antitoxin of not less than 10,000 units, this dose to be repeated within twelve hours, and again repeated in twenty-four hours if symptoms continue. With the first intraspinal dose it is advisable to give an intravenous dose of 5,000 or 10,000 units, with the object of immediately neutralizing any toxin present in the blood. Further use of antitoxin is of doubtful value.

METHOD OF ADMINISTRATION

The technic of administering an intraspinal dose of tetanus antitoxin is identical with that of the administration of antimeningitis serum. On theoretical grounds, in order to facilitate the thorough dissemination of the antitoxin throughout the spinal canal, it is advised to dilute the antitoxin with sterile physiologic sodium chlorid solution up to an amount of from 15 to 30 c.c.—the former in the case of young children. The use of general anesthesia is necessary when opisthotonos is so marked as to render impossible the introduction of the needle between the spinous processes, or if convulsions are continuous and easily incited.

Serum should never be forced into the canal, but should flow in slowly by gravity. The operation of administering antitoxin intraspinally is not a difficult one, but should never be undertaken by the inexperienced. In the event of no one of experience being obtainable, an intravenous dose of 10,000 units should be given at once rather than delay. In addition to the specific treatment the patient should be freed from every possible source of irritation, from noise, bright light, and fussy attention. The use of sedatives is usually indicated, but conservatism in the administration of depressing sedatives is extremely advisable.

SERUM COMPLICATIONS

The administration of serum intraspinally, when properly performed, is subject to the same but no greater risk than the administration of serum intravenously.

Anaphylactic symptoms occasionally occur after an intraspinal dose of serum, and almost as rapidly as when the serum is introduced into the blood. If there is a reason to suppose that a patient is sensitized to horse serum, it is well to introduce the intraspinal dose unusually slowly and to stop the flow of serum immediately if the symptoms are very threatening; or a few drops of serum may be introduced into a vein to test out the presence of sensitization before an intraspinal does is administered. However, in view of the fact that severe anaphylaxis has rarely been reported, and of the extremely bad prognosis in acute tetanus, the possible dangers attendant on the administration of tetanus antitoxin should be minimized and the risk incurred.

(Series to be continued next week)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

NEOCINCHOPHEN.—Ethyl 6-methyl-2-phenyl-quinolin-4-carboxylate, the ethyl ester of methyl-phenyl-quinolin-carboxylic acid.—$CH_3C_9H_4N.C_6H_4COOC_2H_5$, 6:2:4.

Actions and Uses.—The same as those of Cinchophen [Phenylcinchoninic Acid and Phenylcinchoninic Acid Derivative (New and Nonofficial Remedies, 1920, p. 224)].

Dosage.—Same as that of cinchophen. Neocinchophen is practically tasteless.

Neocinchophen is a pale yellow, crystalline powder; odorless and tasteless; permanent in the air.

Neocinchophen is nearly insoluble in water and in dilute alkalis; soluble in hot alcohol and in strong acids; very soluble in ether and chloroform.

The melting point of neocinchophen is not below 75 C.

Boil 0.1 Gm. of neocinchophen with 0.5 Cc. of sodium hydroxide solution and add 5 Cc. of iodine test solution. The odor of iodoform is apparent.

Dissolve 0.1 Gm. of neocinchophen in 1 Cc. of sulphuric acid and add bromine water test solution drop by drop until an excess has been added. A yellow precipitate results.

Boil 0.1 Gm. of neocinchophen with 1 Cc. of hydrochloric acid, filter while hot and add a few drops of platinic chloride test solution. A yellow, crystalline precipitate results.

Add a few drops of ferric chloride test solution to an alcoholic solution of neocinchophen (1-100). A yellow color is produced (*distinction from cinchophen*, which produces a reddish brown color).

Warm about 0.5 Gm. of neocinchophen in 10 Cc. of ammonia water. The substance does not dissolve (*distinction from cinchophen*).

Incinerate about 0.5 Gm. of neocinchophen, accurately weighed. Not more than 0.1 per cent. of residue remains.

Tolysin.—A brand of neocinchophen complying with the N. N. R. standards. Manufactured by the Calco Chemical Company, Newark, N. J. U. S. Patent No. 1,045,759 (Nov. 26, 1912; expires 1920), under license from the Chemical Foundation, Inc. U. S. Trademark No. 133,369.

Tolysin Tablets 5 grains.—Each tablet contains Tolysin, 5 grains.

SALIGENIN.—Salicyl Alcohol.—*d*-Hydroxybenzyl Alcohol.—1:2-Phenolmethylol.—$C_6H_4(OH).CH_2OH$.

Actions and Uses.—Saligenin is a local anesthetic similar in action to procaine. It is said to be as effective as procaine but much less toxic; also the anesthesia produced lasts longer and for this reason the addition of epinephrine is not necessary. Weak solutions are relatively ineffective when applied to intact mucous membranes, but strong solutions (12 per cent.) exert a definite numbing effect.

Dosage.—The same as procaine, which see.

Saligenin was first described by Piria (*Ann. Chem. Pharm.* **56**: 37, 1845) who obtained it by action of emulsin on salicin. The pharmacologic properties and therapeutic applications of saligenin were investigated by Hirschfelder and his collaborators (*J. Pharmacol. & Exper. Therap.* **15**: 261, 1920), who reported that it was many times less toxic than the other local anesthetics studied, and that it was well suited for use in practical surgery.

Saligenin occurs in white, rhombohedral plates or as a white crystalline powder; odor faintly aromatic; taste slightly burning, followed by a sense of numbness. Permanent in the air.

Saligenin is soluble in water and chloroform; freely soluble in alcohol and ether; also soluble in the fixed and volatile oils.

The aqueous solution of saligenin (1:25) is neutral to litmus paper.

The aqueous solution of saligenin is not precipitated by the usual alkaloidal reagents, but it is instantly decomposed by potassium permanganate test solution.

Saligenin melts at from 85 to 86 C.

Add a few drops of sulphuric acid to about 0.01 gm. of saligenin. The particles instantly become cherry-red while the acid is but slightly colored (*distinction from other local anesthetics*).

Add a few drops of ferric chloride test solution to about 0.01 Gm. of saligenin. A grass green color is produced which is persistent. On dilution with water the solution becomes bluish-violet.

Moisten a piece of filter paper with a few drops of water. Place about 0.5 Gm. of saligenin on the moistened paper and move the crystals about with a spatula. Allow the paper to dry in a place protected from dust and remove most of the crystals by gently shaking. The paper should not be stained (*absence of dyes*).

Incinerate about 1 Gm. of saligenin accurately weighed. The ash does not exceed 0.1 per cent.

Saligaine.—A brand of saligenin complying with the N. N. R. standards.

Manufactured by The Calco Chemical Co., Bound Brook, N. J. No U. S. patent. U. S. trademark applied for.

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SATURDAY, JANUARY 8, 1921

HEMATINEMIA

Decomposition of the blood pigment, hemoglobin, undoubtedly occurs in the body under a variety of pathologic conditions. Some of its derivatives which arise in this way are familiar as excretory products, and their presence is always an indication of the existence of abnormal processes somewhere in the body. Thus, methemoglobin in the blood and hematoporphyrin in the urine promptly suggest the possibility of intoxication; they are indexes, so to speak, of poisoning with chemical compounds like nitrites, chlorates, sulphonal, trional and quinin. To what extent the same hemoglobin derivative may arise out of more direct anomalies of pigment metabolism is not yet clear.

Judging from recent observations made by several investigators in the hospitals of Hamburg, too little attention has been paid in the past to the appearance of hematin as a pathologic pigment in the blood. By the application of refined methods of spectroscopic examination, this more immediate derivative of hemoglobin, representing as it does the nonprotein, pigmentary part of the red blood cell component, has already been found in a variety of disorders. The latter were in most cases such as in some way involved an abnormal disintegration of erythrocytes. Schumm,[1] who has called attention to the new importance of this subject, states that pronounced tests have been observed thus far most commonly in pernicious anemia, certain types of eclampsia, and infections with *B. emphysematosus*, as well as in various intoxications. The earliest observations of the latter referred to poisoning with chromium salts. Subsequently, Feigl[2] emphasized the appearance of hematin as the consequence of intoxication with chlorates. In malaria, in which the appearance of hematin might be predicted on general principles, it is usually present, though the amount in the circulation may be so small as to escape detection except by careful search. A pronounced hematin content in the blood may speedily disappear under favorable circumstances.

1. Schumm, O.: Ztschr. f. physiol. Chem. **80**: 1, 1912; **87**: 171, 1913; **97**: 32, 1916.
2. Feigl, J.: Ueber das Auftreten von Hämatin im Blute bei Vergiftung mit Chloraten, Biochem. Ztschr. **74**: 394 (May 18) 1916.

The close chemical resemblance between bile and blood pigments is familiar to physiologic chemists. Schumm has maintained that the possible relationships between methemoglobin, hematin and bilirubin in the blood are by no means yet cleared up. Sometimes all of these compounds make their appearance together. Like bilirubin, hematin may at times appear in the urine. Furthermore, in a few of the carefully studied cases of hematinemia a peculiar brownish-yellow coloration of the skin, recalling the cutaneous appearances of true icterus, has been reported. A further possible confusion in the diagnosis of such jaundice has been suggested by the discovery of carotinemia,[3] with its abnormal skin-color manifestations. Evidently the time has come when the careful discrimination of the varied types of icterus-like pigmentation phenomena in man will need to be better appreciated.

THE PROPOSED AMENDMENT TO THE HARRISON NARCOTIC LAW

A bill has been introduced into each house of Congress at the present session to amend the Harrison Narcotic Law in several important particulars. The bill is designed to relieve the United States from the odium of participation in the extension of the narcotic menace in other countries, as well as to afford a better protection for our own citizens. This amendment includes provisions so that (1) no narcotics may be imported into the United States, except such as are actually needed here for the treatment of disease, for scientific investigation, or for other legitimate purposes; (2) no narcotics may be exported from the United States, and (3) foreign owned narcotics may not be shipped in bond through the territory of the United States. Subcommittees from both houses of Congress have held hearings on the proposed amendment and a great amount of evidence has been submitted. Social workers and reformers, clergymen, physicians, travelers, ex-ambassadors, educators, members of Congress and public spirited citizens from all walks of life have appeared or offered documentary evidence in support of the measure. Manufacturers and the interests which have profited by the traffic have protested and are protesting against any change in the Harrison law.

Following a world awakened public consciousness of the dangers from the use of narcotic drugs, an international opium commission met at Shanghai in 1909 to consider the situation. This was followed by the International Opium Conference which met at The Hague in 1911. This conference adopted measures aimed to prevent the smuggling into China of narcotics and other interdicted substances. As one of the signatories to this convention, the United States is morally bound to maintain its good faith by aiding in carrying out this provision. Early in 1914, the Harrison Nar-

3. Carotinemia, editorial, J. A. M. A. **74**: 32 Jan. 3, 1920.

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cotic Law was passed. Under this law and its regulations no narcotics may be imported into the United States without a license, and the amounts imported must be reported to the governmental authorities. In turn, no narcotics may be sold or otherwise distributed except through an order form furnished by the government. By this system, supposedly, every grain of narcotic legitimately imported or manufactured may be followed to the consumer. However, provisions are made for the exportation of narcotics, and therein lies one of the weak points in the law. Permits to export narcotics may be obtained, provided the ultimate destination of the drug be declared and the shipment be not contrary to the laws of the receiving country. If the receiving dealer is unscrupulous, he may smuggle the drug into forbidden territory or otherwise dispose of it surreptitiously. In any event, the United States has no further control over it. According to the evidence before Congress, the greater portions of the narcotics imported into the United States are not used here but, after refining, are exported to Canada and Japan. The narcotics going to Canada are alleged for the most part to be smuggled back into this country and eventually, by underground channels, to reach the drug habitués. In this way a vast amount of damage is done to certain of our citizens which our present laws appear powerless to prevent. Likewise, the narcotics sent to Japan are said not to be used there, at least to any great extent, but to be smuggled into China. In other words, while our own and the Chinese laws prevent the entrance of American narcotics into China, the laws are evaded by shipping the drugs to Japan, thus leaving the infringement of the Chinese laws to the conscience of the Japanese. For American manufacturers this practice is technically legal, but morally it is reprehensible in the extreme. In addition, under our present laws, foreign owned narcotics may pass in bond through the territory of the United States without disturbance. Under this privilege, it is alleged, vast quantities of narcotics, shipped to Japan but in reality destined for China, pass across our continent every year.

For centuries the Chinese nation has realized the demoralizing influence of the opium habit on its people. Three generations ago it fought the opium war against Great Britain in an unsuccessful attempt to prevent the importation of opium from India. Although, by the terms of peace at the close of that war, China was forced to permit the importation of opium, it has struggled steadfastly through the decades since that time against opium and all of its preparations. Later, because of the exorbitant price of the imported article, China itself began to produce opium; but public opinion was always opposed to this. Then in 1906 the Empire of China entered into an agreement with the British government by which the importation of opium into China from India and the production of opium in China should cease within ten years. Each nation has kept its part of the agreement faithfully, and today no opium or its derivatives may be imported lawfully into China and no opium is produced there. About two years ago the last opium not contraband remaining in China was purchased by the Chinese Republic and publicly destroyed, at a loss, it is alleged, of about $30,000,000.

The evidence before Congress justifies the opinion that if exportation of all narcotics from the United States is forbidden and the "in transit" shipping privileges withdrawn, as is proposed by this amendment, a great proportion of the alleged smuggling of narcotic drugs into this country along the Canadian border will be prevented. Further, America will be cleared from any part in the crime of narcotizing the citizens of the Chinese Republic. Certainly, it would seem to be the duty of the United States both to protect its own citizens and to aid China in its fight against the narcotic evil.

SERUMS AND VACCINES IN THERAPY

The acceptance of a remedy in legitimate therapeusis should depend on the presentation of scientific data and on dependable evidence of its effectiveness in relief or cure of disease. While it is true that some important remedies, as mercury in syphilis and quinin in malaria, have been discovered through clinical observation unaided by preliminary laboratory studies, the discovery of many others, as arsphenamin, has been possible only through long and careful scientific investigation, followed by clinical confirmation of anticipated therapeutic properties. In the development of serums and vaccines, scientific investigation and experimentation have, of necessity, preceded clinical tests of those products which have proved of permanent worth. Whenever the clinical use of serums and vaccines has proceeded beyond well established facts determined by laboratory research, the result has usually been disappointing, and it has been necessary to discard work that has cost enormously in hours of labor. Clinical investigation of the action of a remedy in any disease in which the natural outcome is variable and affected by many remote factors requires many observations with suitable controls, in order that reliable conclusions may be drawn, and, compared with laboratory methods of investigation, in which the unknown factors can be largely eliminated, is more expensive in time and uncertain in results. Scientific investigation and clinical observation must go hand in hand, each acting as a control on the other; but to submit a serum or vaccine for clinical trial without successful preliminary laboratory investigation of its probable worth is an imposition on the profession.

The serum treatment of disease dates from the discovery and application of diphtheria antitoxin by Behring and Roux, and the use of vaccines from the application of antityphoid vaccination in man by

Wright. The success of both these remedies has not only established them firmly and pointed the way to the development of similar methods of curative or preventive treatment in other diseases, but also has served to prejudice the profession and public in favor of vaccines and serums to such an extent that they are willing to accept a new serum or vaccine merely because it is a serum or vaccine, without inquiring critically into its claims of efficacy in the cure of the disease for which it is proposed. As Flexner [1] has pointed out in his introduction to the series of articles now being published in THE JOURNAL, "when diphtheria antitoxin was found to have a high therapeutic value in the treatment of diphtheria, the hope was entertained that, as the bacterial incitants of disease or causes of the various infectious diseases came to be known, each in turn could be made to yield a corresponding antiserum, and thus a high degree of therapeutic control of these diseases would quickly be secured. As a matter of fact, this millenial hope has been realized in only a few instances, and expanding knowledge of the nature of the processes of infection, as well as the properties of the different bacterial agents causing disease, is gradually supplying the reasons for success, on the one hand, and failure, on the other."

The history of antipneumococcus serum affords a striking example of the difficulties and unforeseen pitfalls that are encountered in the development of remedies of this class. Soon after the demonstration of the causal relation of the pneumococcus to lobar pneumonia, an antiserum was made by the immunization of animals, and was shown to protect other animals against infection by pneumococci. This result was confirmed by some observers, but failed of confirmation by others. The antiserum was at once introduced into the clinic, and soon clinical reports appeared, some favorable, and some, more critically compiled, doubtful or unfavorable. The clinical use of this serum continued for years, until the weight of clinical opinion caused its abandonment as of no value in pneumonia. In 1910 it was discovered that the pneumococcus group consists of several types which differ immunologically, and further research has shown that a serum effective against one type of pneumococcus is not effective against other types. Thus far only one therapeutically active serum, Type I, has been developed, and this serum is not effective against infections by other types of pneumococci. The reasons for the conflicting laboratory results and the clinical failure of the antipneumococcic serums of previous years are thus evident. And yet, with these facts readily ascertainable, we are today being offered for clinical use "polyvalent" antipneumococcic serums, recommended by the makers for use in all types of pneumococcus infection. The futility and wastefulness of time and material of trying to determine by clinical observation whether or not a polyvalent serum is of value, when scientific laboratory evidence indicates in advance that a favorable action is not to be anticipated, should need no emphasis. Antiserums for other infections have been developed, some of which are therapeutically active, and others inactive. The reasons for these successes and failures are in many instances well understood; in others the determining factors are more obscure, but in any case we have the results of laboratory investigation as a guide, which can save us fruitless efforts in undefined clinical fields.

As may be seen, the entire subject of the therapeutic action of serums and vaccines needs critical review, in order that the facts in relation to each disease may be made available for the information of the profession. It is hoped that the present series of articles may be of assistance in establishing the proper relation of serums and vaccines to other methods of therapy in infectious disease.

1. Flexner, Simon: Biologic Therapy: General Considerations Regarding Serum and Vaccine Therapy, J. A. M. A. 76:33 (Jan. 1) 1921.

Current Comment

SOME ASPECTS OF INHALATION THERAPY

Inhalation is not unknown as a method of securing the introduction of potent drugs into the organism, even in cases other than those of the volatile anesthetics commonly administered by way of the respiratory tract. The possibility of effecting absorption of many substances through this channel is beyond question. Mercury, for example, has been administered by inhalation. The difficulties that attend such a procedure relate in particular to the uncertainties of accurate dosage. For highly potent substances the possibility of introducing too much of the active agent is always to be reckoned with, and the excess cannot invariably be removed so easily by respiration as it is in the case of volatilized anesthetics. This has heretofore mitigated against the widespread use of the inhalation method. Recent physiologic investigations have indicated in an increasing degree that the mucosa of the respiratory tract represents a membrane through which absorption goes on with surprising ease. Winternitz and Smith [1] of Yale University have pointed out, for example, that the lungs of dogs can be entirely flooded with salt solution and the process of irrigation continued for at least two hours with the introduction of 30,000 c.c. of fluid without causing any evident harmful signs in bodily well being or any subsequent serious microscopic lesions in the lung tissue. Salt solution given to dogs by insufflation is rapidly absorbed from the lungs. Heubner and Rona [2] have lately demonstrated that calcium chlorid solutions can be "nebulized" for inhalation so that the salt is actually absorbed from the respiratory tract. As there seem to be occasions, uncertain though they are, when a calcium therapy is indicated, and since absorption by the alimentary tract is slow, indefinite and undependable, while subcutaneous

1. Winternitz, M. C., and Smith, G. H.: Intrapulmonary Irrigation, Proc. Soc. Exper. Biol. & Med. 18:55, 1919.
2. Heubner, W., and Rona, P.: Ueber den Kalkgehalt des Blutes kalkbehandelter Katzen, Biochem. Ztschr. 93:187 (Feb.) 1919.

or intravenous introduction is objectionable or impracticable or both, attention becomes directed to the possibilities of inhalation. Zuelzer,[3] in fact, proposed this procedure several years ago. Since considerable doses of calcium salts are needed to increase the available amount of the element in the body, Heubner and Rona, while admitting absorption from the respiratory tract without noticeable local damage, have come to the conclusion that the inhalation method does not offer any promising outlook for therapeutic application in man. Small quantities are of dubious value; larger amounts presented through inhalation are liable to exceed the limits of advisable concentration in the blood without any suitable mode of regulation. This warning may be timely at a period when therapeutic novelties are likely to be proposed in increasing numbers.

THE PASSING OF THE INTERDEPARTMENTAL SOCIAL HYGIENE BOARD

As reported elsewhere,[4] the House Committee on Appropriations has cut out of the Sundry Civil Bill the appropriation of $2,246,924 for the Interdepartmental Social Hygiene Board. It is to be hoped that the Senate will concur in this decision. Such action will practically abolish this organization. The Interdepartmental Hygiene Board was created to meet a war time emergency. It is one of the few war bodies that has refused to demobilize. Instead, it has sought to establish itself as a permanent peace time organization. It has endeavored to extend its activities and to secure increased appropriations. In developing its program, it has shown an inability to distinguish between measures for the proper regulation of public health and those intended for the control of public and individual morals. It is clearly duplicating the work of the Division on Venereal Diseases of the United States Public Health Service. Its policy requires a growing personnel, a bureaucratic system of centralized administration, the distribution of federal money for state and local activities, and the control or dictation from Washington of state and local policies. Any one of these reasons is ample justification for the elimination of this organization, the need for which has long since disappeared.

DIREFUL FACTS FOR THE ANTI-VACCINATION CULT

We who live amid the personal safety that vaccination against smallpox has brought are likely to fail to realize its blessings. It is true that now and then, as recently occurred in California, intelligent, public spirited citizens, following the leadership of the medical profession, are compelled to come to the defense of vaccination as a public health measure against the bigotry of misdirected effort. In general, however, the institution of vaccination no longer needs a champion. If smallpox were permitted to become a pandemic raging over the entire world, as it certainly would if the disease were not held in check by compulsory vaccination, it would still the fears, as Councilman once naively remarked, of those who dread an excess of population. The expected mortality from smallpox can be computed with reasonable approximation on the basis of available data. The probable morbidity is not so easily estimated. The statistics of smallpox are like those of the incidence of starvation. A student of the subject humorously remarked that in countries in which smallpox and famine occur there are no statistics; in places where statistics are found, smallpox and famine are missing. However, Kisskalt and Stoppenbrink[1] of Kiel have succeeded in collecting data of the occurrence of disease in the city of Königsberg from 1773 to 1803, before the days of vaccination. Although the individual years showed great differences in the numbers of cases of smallpox, freedom from its presence was never attained. The danger to the patient was in general greatest during the second year of life. The astounding outcome of the statistical investigation is that out of every hundred children born during those eventful years, an average of eleven (and sometimes as many as fifteen) were destined to die of smallpox before they reached their tenth birthday. We recommend these facts to those cults and persons who still dare to threaten a return to comparable conditions of the neglect of public health.

WHY PERFORM THE STATE'S FUNCTIONS?—A PERTINENT QUESTION

As mentioned in the news department, the American Medical Association's headquarters were visited a few days ago by a group of noted men, most of them physicians, representing the ministry of public health and physical education of Czechoslovakia. These distinguished guests seemed greatly impressed with the educational activities of the Association. Especially were they astonished at the work of the Council on Pharmacy and Chemistry, that of the Propaganda department of THE JOURNAL, that of the A. M. A. Chemical Laboratory, and that of medical education and licensure. At every turn they raised the question, "But why is such work not done by the state?" The question comes logically and naturally from those who are not thoroughly familiar with American institutions and governmental functionings. In Utopia much of the work now done by the American Medical Association would not be done by, or expected of, a scientific organization. But we do not live in Utopia and the work *is* done because at present public health activities that run counter to vast vested interests—such as the nostrum trade—are touched but lightly and gingerly by governmental agencies. Recognizing the need of such work, the medical profession, through its organization the American Medical Association, has assumed the burden of carrying it on. Contrary to the jibes of those whose financial interests are threatened by all educational work in the interest of the public health, the medical profession has no selfish cause to further by such work. That which makes for health may and does redound to the credit of the medical profession, but obviously it cannot financially benefit that profession.

3. Zuelzer: Berl. klin. Wchnschr., 1911, p. 285.
4. See Government Services, p. 123, this issue.

1. Kisskalt, K., and Stoppenbrink, Clara: Die Alterssterblichkeit an Pocken vor Einführung der Impfung, Ztschr. f. Hyg. 90: 478 (June) 1920.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Burr Ferguson, Birmingham, formerly surgeon of the Tennessee Coal, Iron and Railroad Hospital, has left for Holland, where he will serve as medical inspector of immigration at Rotterdam, under the direction of the U. S. Public Health Service.

New Health Officer.—Dr. Edward Helwig, Indianapolis, has been appointed health officer of Montgomery city and county to succeed Dr. Frederick W. Dershimer, resigned. It is understood that Dr. Dershimer will resume his position as director of sanitation of the state board of health.

ARIZONA

Additions to Public Health Service Hospital.—Work will be started immediately on the addition to the Public Health Service hospital for tuberculous patients at Tucson. An allotment of $250,000 has been made for alterations and improvements.

CALIFORNIA

New Hospital.—Dr. George Scott Martin has opened a new hospital, known as the Riverside Hospital, at Susanville. The hospital has a capacity of fifty beds, and is designed to care for local industrial and private cases.

License Revocation Affirmed.—It is reported that the right of the State Board of Medical Examiners to revoke a license for unprofessional conduct in methods of advertising such as are likely to deceive the public and impose on credulous persons was upheld in a recent decision by the district court of appeals at Los Angeles. The decision was made in the case of Dr. Thomas F. Glass, Los Angeles, whose license had been revoked for such alleged unprofessional conduct; the action of the state board was affirmed.

Stolen Diploma Returned.—In 1902, a man bearing on successive occasions the names of Zangwell and Thompson stole from Dr. Galen R. Hickok, Satanta, Kan., his medical diploma and several state licenses. Zangwell, or Thompson, then assumed the name of Galen R. Hickok and under that name has been practicing in California since 1909. He had repeatedly been arrested charged with the performance of criminal operations but through various technicalities had been released. He was again arrested, Aug. 31, 1920, and this time it is reported that he has been convicted and sentenced to prison for a term of from two to five years. The original Dr. Galen R. Hickok reports that his diploma has been returned to him.

CONNECTICUT

New Hospital at Bridgeport.—A new hospital, known as the Columbus Hospital, has been established at 586 Washington Ave., Bridgeport, by Dr. Pasquale Romeo. The hospital has accommodations for forty patients.

Supervision of Infants.—The Bridgeport Department of Health has planned to inaugurate a system whereby every newly born infant will be carefully supervised and periodically visited by a district nurse appointed for that special purpose. The period of observation will extend over the first year of the child's life.

DISTRICT OF COLUMBIA

Personal.—Dr. Daniel L. Borden has been appointed a member of the board of fire and police surgeons to fill a vacancy caused by the resignation of Dr. Howard Hume.

Memorial Exercises for General Gorgas.—Services in memory of the late Major-Gen. William C. Gorgas will be held in the Hall of the Americas of the Pan-American Building, January 16, under the auspices of the Southern Society of Washington. The Secretary of War, Secretary of the Navy, Secretary of State, Adjt.-Gen. Peter C. Harris, Sir Auckland Geddes, and diplomatic representatives of Cuba, Panama, and South American countries will deliver memorial addresses.

FLORIDA

County Offered Hospital Fund.—Lee County has been offered a donation of $5,000 in cash and property valued at $12,000 on McGregor Boulevard, a short distance beyond the city of Fort Myers, on condition that the citizens raise an additional $5,000 for the erection of a hospital. The offer is made by Mr. and Mrs. Med R. Kellum, and it is stipulated that it must be accepted before Jan. 1, 1922, and that the hospital shall be completed within five years. The Robert E. Lee Memorial Hospital, at Victoria Avenue and Heitman Street, Fort Myers, is inadequate to meet the needs of the community.

ILLINOIS

Smallpox at Oak Park.—The discovery of a number of cases of smallpox among schoolchildren of Oak Park led to a closing of the schools in advance of the regular holiday schedule. Upward of 7,000 children were sent home with orders not to return to school until they could furnish a certificate testifying that they had been successfully vaccinated.

Chicago

Meeting of Nurses' Association.—The thirty-first annual meeting of the Visiting Nurse Association of Chicago, will be held at the Blackstone Hotel, January 11, at 3 p. m.

Club Discusses Industrial Relations.—The Physicians' Club of Chicago gave a banquet, January 4, at the Auditorium Hotel, at which the subject of "Industrial Relations" was the chief topic of discussion.

Medical Society Program.—At the first meeting of the year of the Chicago Medical Society, to be held Wednesday evening, January 12, Dr. Mark White, Minneapolis, will review his researches on digitalis, and Dr. Arthur Dean Bevan will read a paper on "Tumors of the Breast."

Hotel Employees Vaccinated.—Physicians of the health department of Chicago were assigned to vaccinate about 150 employees of a large hotel in the business district following the removal to the Isolation Hospital of a chambermaid afflicted with smallpox in the seventh day of development.

Health Department Extends Activities.—Health Commissioner John D. Robertson has announced the formation in the health department of a bureau of hospitals and social and industrial hygiene under the charge of Dr. Lee Alexander Stone. In addition to taking over the work of the old hospital bureau the new bureau will have charge of the enforcement of ordinances relating to safety appliances, ventilation and sanitation. A bureau of water control, under the supervision of Dr. Herman N. Bundesen, epidemiologist, has been authorized by the finance committee of the city council.

INDIANA

County Hospital Offered Fund.—It has been announced that Wayne County has been offered $50,000 in Liberty bonds if the county will appropriate an additional $50,000 for the work of equipping a hospital. A site was recently donated by Mr. and Mrs. David Esteb.

New Clinics at Indianapolis.—A new tuberculosis clinic was recently opened at 27 West Morris Street, Indianapolis, under the supervision of Dr. Reuben A. Solomon. The clinic will be open on Monday, Wednesday and Saturday mornings from 8 to 10. A new night clinic has been established at 102 North Senate Avenue and will be open Tuesday and Friday evenings. Dr. Edward M. Amos has been appointed clinician.

Smallpox Outbreak.—An extensive epidemic of smallpox has impelled the board of health of East Chicago to take strenuous restrictive measures. The entire south side of the town, in which the majority of the cases were discovered, has been subjected to rigid quarantine. An appropriation of $50,000 has been requested from the city council to combat the disease, more than 100 cases of which were reported up to January 4. The disease is of a moderately mild type.

KANSAS

State Asylum Burns.—Fire at the Kansas State Hospital at Topeka on Christmas Day caused a loss estimated at $10,000. Forty patients in the building were removed safely, many of them having been carried out through the flames and smoke by Dr. Middleton A. Perry, superintendent, and attendants. Five inmates of the asylum escaped from custody.

LOUISIANA

New Sanitary Officer.—Dr. Edmund L. Leckert has been appointed secretary-treasurer and sanitary officer of the New Orleans Board of Health to succeed Dr. Frank R. Gomilla.

Narcotic Clinic Taken Over.—At a meeting of the Caddo Parish Board of Health, Shreveport, an ordinance was adopted to take over the narcotic clinic hitherto conducted at the Schumpert Sanatorium by Dr. Willis P. Butler.

Orleans Parish Society Officers.—Dr. Stephen M. Blackshear was elected president of the Orleans Parish Medical Society at the annual meeting of the society. Other officers were elected as follows: vice presidents, Drs. William H. Block, William H. Harris and Frank R. Gomilla; secretary, Dr. Elizabeth Bass, and treasurer, Dr. John A. Lanford.

Hospital Staff Appointments.—At the meeting of the board of the Shreveport State Charity Hospital, Dr. Warren P. Morrill was appointed superintendent, and the following physicians were elected members of the advisory board and chiefs of departments: Dr. Joseph E. Knighton, medicine; Dr. Archibald B. Nelson, surgery; Dr. John L. Scales, eye, ear, nose and throat; Dr. Milton F. Smith, obstetrics; Dr. Michael S. Picard, pediatrics; Dr. Isadore B. Rougon, genito-urinary and skin diseases, and Dr. Clifford P. Rutledge. Dr. Morrill was elected secretary-treasurer of the board of directors.

MASSACHUSETTS

License Revocations.—It is reported that the State Board of Registration in Medicine has revoked the license to practice medicine of Dr. Joseph A. Keown, formerly of Lynn, who has been adjudged insane by the courts.

Cutter Lectures.—The Cutter lectures on preventive medicine and hygiene will be delivered at the Harvard Medical School amphitheater, January 11 and 12, at 5 p. m., by Dr. Alonzo Taylor, on "General and Specific Effects of Prolonged Subnutrition." The lectures are given annually under the terms of a bequest from John Clarence Cutter, and are free to the medical profession, to the press, and to others who are interested.

Harvard Medical Lectures.—The annual winter series of Sunday afternoon lectures on medical subjects by members of the faculty of Harvard University Medical School was initiated, January 2, by Dr. Robert W. Lovett, who spoke on "Infantile Paralysis." The next lecture will be delivered, January 9, by Dr. Alfred P. Rogers, on "The Correction of Dental and Facial Mal-Development in Children." The entire series includes thirteen lectures which are carefully arranged to cover subjects of public interest.

State Maternity Welfare Bill.—After an extended study by a special commission to investigate maternity benefits, a bill requesting an appropriation of $300,000 for the first year has been presented to the special session of the state legislature. It is proposed to use the fund chiefly for organizing a staff of nurses. Suggestions for cash benefits as a primary provision in the infant welfare movement were rejected by the commission, which was in favor of a system of education in the laws of hygiene and adequate nursing service. The medical members of the commission include Drs. Alfred Worcester, Waltham; Eugene R. Kelley, Boston; Merrill E. Champion, Boston, and Louis I. Dublin, New York.

MICHIGAN

State Tuberculosis Clinic.—A tuberculosis clinic will be held under the auspices of the state board of health at the Red Cross headquarters in North Saginaw Street, Pontiac, from January 31 to February 4. Dr. J. W. Deacon of the state board of health will have supervision of the clinic.

Society Meeting.—Dr. Harry M. Richter, professor of surgery in Northwestern University Medical School, Chicago, was the guest of the Muskegon County Medical Society at its annual banquet, December 10. Acting on the suggestion of City Manager Ellison, the society adopted a resolution that all physicians display on the radiator of their automobiles the emblem of the caduceus, the symbol of the medical profession.

MINNESOTA

Tuberculosis Scholarship.—The terms governing the award of a tuberculosis research scholarship, recently donated by Dr. Henry Longstreet Taylor, St. Paul, to the University of Minnesota, have been announced. The scholarship will be known as the Pokegama Scholarship in Tuberculosis and will amount to $1,000 during the first year, $1,250 in the second year, and $1,500 in the third year.

New County Health Organization.—A coordinate body, to be known as the Central Health Committee of Pennington County, was recently formed at a meeting of representatives of the various health and welfare associations of the county, held in the City Auditorium, Thief River Falls. Dr. Maurice G. Milan, medical director of the Oakland Park Sanatorium, was elected president of the new organization.

MISSOURI

New Health Officer.—Dr. J. W. Campbell has been appointed health officer of St. Louis.

Hospital Under Construction.—Work has been initiated on the construction of the new St. Luke's Hospital, on a 4 acre tract on Mill Creek Parkway, Kansas City.

Compulsory Notification of Diseases.—A recent order of the Missouri State Board of Health lists the following diseases as compulsorily reportable: anthrax, chickenpox, diphtheria, glanders, influenza, leprosy, measles, epidemic cerebrospinal meningitis, mumps, ophthalmia neonatorum (infantile), plague, acute anterior poliomyelitis, rabies, scarlet fever, smallpox, sore throat (epidemic or septic), tetanus, trachoma, tuberculosis, typhoid fever, whooping cough, and all venereal diseases. Failure to report any of these diseases is a punishable misdemeanor. The attending physician is held responsible for making the report to the local health department or local health officer, but if no physician is in attendance the head of the household is responsible.

NEBRASKA

Free Clinic at Norfolk.—A free general and special clinic has been opened in the Verges Sanatorium, Norfolk.

State Association Secretary Entertained.—Dr. Roy B. Adams, Lincoln, has been elected secretary of the Nebraska State Medical Association, to succeed Dr. Joseph M. Aiken, deceased. The Lancaster branch of the association tendered Dr. Adams a banquet at the Lincoln Hotel, Lincoln, December 9, at which visiting physicians from several adjacent counties were present.

NEW YORK

Inadequacy of Rural Medical Service.—The Health Department of the State of New York reports that during 1920 information was received from seventy-six districts in thirty-six counties that medical service was inadequate or not procurable. In Delaware County alone nine townships were in need of medical service. The population of these districts ranges from 500 to 6,000, and in most instances the nearest physician is from 5 to 10 miles distant. Forty-seven districts have been supplied with medical service, leaving twenty-nine communities still in need of such service.

Prohibition and Insanity.—Since the advent of prohibition, according to Dr. Horatio M. Pollock, chief statistician of the State Hospital Commission, there has been a considerable decrease in the number of persons committed to the state hospitals for the insane. The collected data indicate that a definite percentage of cases of insanity followed the abuse of alcoholic beverages. In 1909, for instance, 10 per cent. of the persons committed were addicted to the excessive use of alcohol, whereas in 1920, the percentage of such cases was only 1.9. The predicted increase in drug addiction as the result of prohibition is not borne out in statistics of insanity.

New York City

Harvey Society Lecture.—The fifth of the current series of Harvey Society Lectures will be delivered at the New York Academy of Medicine, January 15, by Dr. Alfred F. Hess, on the "Newer Aspects of Some Nutritional Disorders."

Personal.—Dr. Harry Plotz sailed January 7, to assume the duties of director of an American Jewish Relief unit in Eastern and Central Europe.——Dr. James J. Walsh has been elected president of the American Catholic Historical Association.

Brooklyn Hospital Sells Property.—The Brooklyn Eye and Ear Hospital has sold its property to the Polytechnic Institute for $150,000. The hospital directors are negotiating for the purchase of a site for a new hospital on Greene Avenue between Carlton Avenue and Cumberland Street, Brooklyn.

Health Statistics.—During the first eleven months of 1920, the death rate of the city was 12.01 per thousand population, as compared with a rate of 12.51 in the corresponding months of 1919. If this rate has been maintained in December, 1920,

it will constitute a saving of 3,070 lives during the year, as compared with 1919. There has been an increase in the death rate among children and the aged. Of every thousand infants born during this period, eighty-six died in the first year, as against eighty-three in 1919. The increased mortality of children under 5 years of age is attributed to the severe epidemics of measles and whooping cough which prevailed from January to June; there were 574 more deaths from measles and 464 from whooping cough than in the same months of 1919. The increased mortality in the aged was due almost exclusively to the so-called degenerative diseases, which caused 768 more deaths during this period. The deaths from cancer increased by 185. A decrease of 3,540 deaths between the ages of 5 and 65 years is explained by a decrease in the number of deaths from tuberculosis, influenza and other respiratory diseases. Influenza reached its height in February, 1920, when 2,219 deaths from this cause were reported.

NORTH CAROLINA

Personal.—Dr. Alexander C. Bulla has been reelected health officer of Forsyth County.

Tuberculosis Clinics.—The first free tuberculosis clinics in Lenoir County will be held, beginning February 7, by physicians from the state sanatorium in cooperation with local physicians. The clinics will extend over a period of two weeks.

OHIO

Personal.—Dr. Senn F. Whisler has been reelected county health commissioner of Hancock County.——Dr. Cyril Haas, chief physician at the International Hospital at Adena, Cilicia, was recently in Columbus in connection with his tour of inspection of the important medical colleges of the country.

State Tuberculosis Clinics.—Under the joint auspices of the state and local health authorities, the Ohio State Medical Association, Ohio Public Health Association, and Ohio State Sanatorium, free tuberculosis clinics will be conducted throughout the state during the spring months as a part of the district health program. Local physicians in the various districts have been asked to assist in the arrangements for the clinics and have been urged to send suspected cases of tuberculosis for diagnosis.

Medical College Notes.—Dr. Roger S. Morris has resumed charge of the medical staff of the General Hospital and his position on the faculty of the University of Cincinnati College of Medicine, following a year's leave of absence, and the following faculty changes were recently announced: Dr. Edwin W. Mitchell has resigned as director of the department of contagious diseases; Dr. William D. Porter has resigned as professor of clinical obstetrics and assistant director of the obstetric department; Dr. R. S. Austin has been appointed professor of pathology, Drs. Wylie Ayres and Shiro Tashiro, associate professor of biochemistry, and Dr. Salmen K. Siebler, assistant in pediatrics. Dr. Gustav Eckstein of the department of physiology has been granted leave of absence for one year for special studies abroad.

OREGON

Proposed League for Health Conservation.—Proposals for the formation of a league for the conservation of public health, modeled on similar leagues already formed in California and Washington, were made at the meeting of the Portland City and County Medical Society, held at Hotel Portland, December 15.

Sterilization Law.—According to an announcement of the state board of health almost 100 persons have been sexually sterilized since the passage of the Sterilization Act in 1919. The operation in each case was done by order of the state board of eugenics, which is constituted of the members of the state board of health, the warden of the state penitentiary, the superintendent of the State Hospital, the superintendent of the Eastern Oregon Hospital, and superintendent of the State Institution for the Feebleminded.

PENNSYLVANIA

School Medical Inspectors.—The following physicians have been appointed medical inspectors of schools by the state commissioner of health: Dr. Joseph R. Beckley, Lebanon, for the Lebanon independent district; Dr. Clayton C. Flatt, for Kinzua and Corydon, and Dr. George F. Drum, Mifflingtown, for Briar Creek township.

Honor to Dr. Gerhard.—Women on the Main Line have united in a campaign to endow a bed in Bryn Mawr Hospital in memory of the late Dr. George S. Gerhard, Overbrook, through whose efforts the hospital was founded. Trustees of the hospital intend to place in the building a tablet bearing a medallion portrait of Dr. Gerhard in commemoration of his services to the institution.

Philadelphia

Personal.—Prof. Edgar Fahs Smith, former provost of the University of Pennsylvania, has been elected president of the American Chemical Society.

Appointment to University Faculty.—Dr. Henry Cuthbert Bazett of Great Britain has been appointed professor of physiology in the Medical School of the University of Pennsylvania to succeed Dr. Henry T. Reichert, who retired last year. Dr. Bazett is the Cheselden Welsh lecturer of clinical physiology at Oxford, England, and was connected with St. Thomas' Medical School.

School Medical Inspection Report.—According to the report of Dr. Walter S. Cornell, chief school medical inspector, more than one half of the public schoolchildren examined during the year had one or more physical defects. Not a case of smallpox has developed in a native Philadelphian in the last fourteen years. Three hundred tuberculous and poorly nourished children are cared for in special classes, and mental clinics and nutrition classes have been established to meet special needs.

RHODE ISLAND

Special Lecture at Brown University.—Dr. Charles R. Stockard, Cornell Medical College, New York, delivered a lecture on the subject of "The Rate of Growth and Quality of Structure," in Sayles Hall, Brown University, Providence, under the auspices of the Sigma Xi Society.

Psychopathic Department Advocated.—At a session of the State Conference of Social Welfare, held December 9, at the Rhode Island Medical Library, Providence, Dr. Charles M. Campbell, director of the Boston Psychopathic Hospital, delivered an address advocating the creation of a psychopathic department, either in hospitals or separately, where nervous and mental diseases may be treated.

SOUTH CAROLINA

New Health Officers.—Dr. Duncan D. Bullock, Roland, N. C., has been appointed health officer of Orangeburg County succeeding Dr. Robert S. Bailey, resigned.——Dr. Percy H. Brigham, New Orleans, has been appointed city health commissioner of Orangeburg.

Dedication of Salvation Army Hospital.—The Salvation Army Hospital at Greenville, the fourth established by this organization in the United States, will be dedicated, January 13. The hospital was erected at a cost of approximately $250,000 and is intended to serve the southeastern section of the country.

Pellagra Investigators Honored.—At a meeting of the Spartanburg County Medical Society held, December 17, special tribute was paid to those investigators who have been connected with the pellagra investigations during the last nine years. The invitations to attend were extended to Drs. Joseph F. Siler, W. J. McNeal, Robert M. Graham, Paul Shule, Joseph Goldberger, Robert Wilson, Edgar A. Hines, James A. Hayne, Stewart Roberts, Seale Harris and Franklin Wood.

TEXAS

Baylor Medical College Acquires Hospital.—At a joint meeting of the directors of the Texas Baptist Memorial Sanitarium and the trustees of Baylor University, held at Dallas, December 11, plans were perfected whereby the sanitarium will hereafter be conducted as a unit of Baylor University. The action was authorized at the last meeting of the Baptist general conference of Texas. A committee was appointed to apply for an amended charter for Baylor University to permit the operation of the sanitarium, which will hereafter be known as Baylor Hospital, under direction of the board of trustees of the university. The hospital will be conducted as a teaching institution in conjunction with the medical school. As soon as the necessary funds have been secured women's and children's hospital buildings will be erected, and a public dispensary will be provided.

VIRGINIA

New Valley Association.—Physicians from seven counties in Shenandoah Valley met at Harrisonburg, December 14, and organized the Medical Association of the Valley of Vir-

ginia. Sixty-four practicing physicians were enrolled as charter members.

Fire at State University.—A fire completely destroyed the office and private laboratory of Dr. J. A. Waddel, professor of pharmacology, and a large amount of apparatus in the physiologic laboratory at the University of Virginia, Charlottesville, on the morning of December 24. The loss is covered by insurance.

Drive for Hospital Fund.—A campaign for a fund of $150,000 for the erection of a new addition to the Roanoke Hospital and for additional equipment will be inaugurated, February 15. The proposed new unit will give the institution a capacity of 100 beds and will provide a maternity ward, children's ward, new operating rooms and other special facilities.

WISCONSIN

Personal.—At a meeting of the Milwaukee Oto-Ophthalmic Society, held in the rooms of the Milwaukee Medical Society, December 14, Dr. Clarence Loeb, Chicago, conducted a clinic hour and gave a special address.——Dr. William H. Bayer, Merrill, has been elected president of the Lincoln County chapter of the American Red Cross.

Society of Industrial Medicine.—Physicians and surgeons employed by industrial corporations of Wisconsin have organized the Wisconsin Association of Industrial Physicians and Surgeons and have elected the following officers: president, Dr. Clare E. Schram, Beloit; vice president, Dr. Robert A. Waite, Milwaukee, and secretary-treasurer, Dr. Robert E. Fitzgerald, Milwaukee.

CANADA

Personal.—Prof. A. B. Macallum of McGill University, Montreal, will deliver a course of lectures, extending over seven months, at the medical college in Pekin, China. He will leave for the Orient in March.

University Fund.—The subscription campaign in aid of McGill University, Montreal, yielded a total of $6,321,511, to which more than 4,000 people contributed. The province of Quebec and the Rockefeller Foundation gave $1,000,000 each, while an additional million was contributed by the graduates.

Hospital News.—A prominent manufacturer of Toronto has donated to the general hospital of his home town, Brantford, Ont., the interest for five years on a $25,000 victory bond, to be used as a trust fund at the discretion of the directors of the hospital.——An agreement has been made between the town of Cobalt, Ont., and the adjoining township of Coleman to equip the old Cook Camp of the Trethewey Mine as an isolation hospital.——A fire at the Muskoka Free Hospital for Consumptives at Gravenhurst, Ont., November 30, destroyed the three main buildings. The 200 patients in the institution were all removed safely.

GENERAL

Metric System as National Standard.—A bill introduced in the United States House of Representatives by Representative Britten of Illinois fixes the metric system of weights and measures as the standard for the United States.

Hygiene of Drinking Water on Steamships.—The U. S. Public Health Service has extended its regulations requiring certified drinking water on railroad trains to include all lake, river and ocean steamships under dominion of the United States.

Hawaiian Medical Society Elects.—The following physicians have been elected officers of the Hawaiian Medical Society for the ensuing year: president, Dr. Frank L. Putman; vice president, Dr. Grover A. Batten; secretary, Dr. Joseph E. Strode, and treasurer, Dr. F. J. Pinkerton.

Lane Lectures.—Dr. L. Emmett Holt of Columbia University, New York, has been appointed Lane Medical Lecturer for the year 1921. The lectures will be delivered at the medical school of Stanford University, San Francisco, during the week beginning November 28, on the general subject of growth and nutrition.

Award of John Scott Medals.—The board of directors of City Trusts of Philadelphia has awarded a premium of $800 and a John Scott Medal to Dr. Hideyo Noguchi of the Rockefeller Institute for Medical Research, in recognition of his work in the discovery of the causative organisms of infectious diseases, and to Dr. Edward Calvin Kendall, Rochester, Minn., in recognition of his work on thyroxin.

Seaboard Railway Surgeons Meeting.—The seventeenth annual session of the Association of Seaboard Air Line Railway Surgeons, held at Savannah, Ga., under the presidency of Dr. Louis J. Picot, Littleton, N. C., the following were elected officers for the ensuing year: president, Dr. Henry C. Dozier, Ocala, Fla.; vice presidents, Drs. Jabez Jones, Savannah, Ga., John H. Smith, Branchville, Va., and Harris Bass, Hendersonville, N. C., and secretary-treasurer, Dr. Jarrett W. Palmer, Ailey, Ga. The next annual meeting will be held in Birmingham.

Association for Research in Nervous and Mental Diseases.—This association held its first annual meeting in New York, Dec. 28-29, 1920; it was successful from every point of view. The following officers were elected for the ensuing year: president, Dr. Walter Timme; vice president, Dr. E. W. Taylor; secretary-treasurer, Dr. Foster Kennedy, all of New York. A commission on scientific work was appointed, composed of the officers ex officio and of the following members: Dr. Charles L. Dana, New York; Dr. William G. Spiller, Philadelphia; Dr. Hugh T. Patrick, Chicago; Dr. Bernard Sachs, New York; Dr. Israel Strauss, New York; Dr. J. Ramsay Hunt, New York, and Dr. Lewellys F. Barker, Baltimore.

Czechoslovakian Commission Studies Health Activities.—A Czechoslovakian commission for the study of public health administration in the United States is making a tour of the principal medical centers of the country, at the invitation of the Rockefeller Foundation, under the guidance of Dr. C. W. Wells of the International Health Board. The commission is composed of Dr. Vladimir Basika, chief of the medical department, Ministry of Public Health, Prague; Dr. Ivan Halek, chief health officer of Slovakia, Bratislava; Dr. Vladimir Petrik, medical superintendent for Slovakia, Bratislava; Dr. B. Vacek, chief health officer of Moravia, Brno; Dr. Karel Driml of the Ministry of Public Health, Prague, and Mr. Antonin Kolinsky, chief legal adviser of the Ministry of Public Health and Physical Education, Prague. While in Chicago, the members of the commission spent an entire morning at the headquarters of the American Medical Association, and expressed great interest in the activities of the Association.

LATIN AMERICA

Centennial of the University of Buenos Aires.—In honor of the centennial year, 1920, of the University of Buenos Aires, the *Revista de la Universidad* is publishing a historical sketch of the work of the university and review of all the theses presented. The entire 300 pages of No. 145 of Vol. 44, just received, are devoted to the period 1852-1873.

FOREIGN

Prize for Nicolle.—The Lasserre prize, which is an endowment in the ministère de l'instruction publique of France, has been awarded to Dr. Charles Nicolle of the Institut Pasteur at Tunis. He was a pioneer in research on transmission of disease by the louse.

The Campaign Against Typhus.—Our French exchanges confirm that the League of Nations through its typhus commission has called upon its members to contribute $8,000,000 to fight typhus in Poland and protect the rest of the world against the spread of the disease. It is estimated that there were 306,000 deaths from typhus in Poland and Galicia during 1920.

International Congress on Physiotherapy.—The fifth international congress for physiotherapy was to have been held in Russia, but this plan has been abandoned, and Madrid selected for the next meeting. It will convene at Madrid in 1922. Prof. Bartrena Costa, the incumbent of the recently organized chair of physiotherapy at the University of Madrid, is president of the committee in charge.

The Medical Orchestra.—The Paris "medical orchestra" gave fine concerts before the war. It is now being reorganized, and the committee in charge appeals to all *confrères instrumentistes* as well as to their wives, sons and daughters and to medical students. A general meeting for organization is soon to be held. The president of the committee is Dr. Richelot, 3 rue Rabelais, and the secretary, Dr. Destouches, 4 rue Thénard.

Tribute to Bordet.—Our Belgian exchanges relate that Brussels planned an ovation for Prof. J. Bordet on his return from Stockholm where he received the Nobel prize in medicine. The municipal and university authorities cooperated with the Fédération médicale, and the "Bordet Day" comprised a ceremony in the morning at the Institut Pasteur

where a bronze medallion was presented; in the afternoon an academic session was held at the Palais d'Egmont, and in the evening a banquet.

Institute for Biologic Research in French Africa.—Our French exchanges mention the creation at Dakar in the French possessions in western Africa of an *institut de biologie* for the study of microbiology in man and animals and the study of biologic chemistry, as well as the production of vaccines and serums and treatment of rabies, etc. Calmette has been urging the organization of laboratories in primitive regions free from the taints which follow civilization, where tuberculosis and other diseases can be experimented with on monkeys and cattle without the influence of heredity and natural contagion.

Annual Meeting of the Swedish Medical Association.—At the annual meeting, Oct. 5, 1920, it was announced that the Pasteur medal had been awarded to Bordet for his complement fixation and whooping cough bacillus discoveries. The jubilee prize was given to Prof. U. Quensel for his research on urine sediment in kidney disease and the origin of tube casts. A legacy from the late Prof. K. G. Lennander was announced, to be applied for "Lennander lectures" on vital medical topics. The society has 1,370 members, which includes thirteen honorary foreign members and 134 foreign members. The latter groups had been added to during the year by election of Naunyn and Krehl of Germany, and of René Leriche, A. Policard and L. Bérard, all professors at the University of Lyons, France, and noted for their work on peripheral sympathectomy, bone and nerve grafting, etc. Six Americans were elected foreign members during the year: Ludvig Hektoen, R. W. Lovett, Lewellys F. Barker, Warfield T. Longcope, Rufus Cole and Peter Bassoe. A subsidy of 500 crowns was awarded Prof. R. Bárány for the purchase of instruments, and a similar amount was given the *Acta oto-laryngologica*. The association had offered a prize for a popularly written work on immunology, but only one was received in competition and this did not comply with the requirements. The association has thirteen endowed funds for stipends, etc., and fifteen for prizes and other scientific rewards.

French Delegation to Study Medical Education in the United States.—The *Presse médicale* of December 11 contains the report of Drs. G. Roussy and E. E. Desmarest, professors at the Paris medical faculty, who were sent as delegates by the University of Paris, at the request of the National Board of Medical Examiners, to examine conditions of medical education in this country. The party included also two delegates from England and one representative of the Triple Examining Board of Scotland. The French delegates express the warmest gratitude for the manner in which they were received and their task facilitated by their American confrères, and congratulate them highly for their initiative, the aim of the mission being to draw closer on the scientific side the ties formed on the battle fields during the war. They add that the Americans thought that the time had come for a closer interchange of students, professors and physicians, in the hope that the day may finally arrive when there will be reciprocity between the license granted by the National Board of Medical Examiners and the licenses granted in Great Britain or France. This mission was requested in order to acquaint the latter countries with the status of medical education in the United States. The delegates visited only the Class A medical schools, and in this instalment of the report describe them as inspected in all the principal cities from New Orleans to Minneapolis and east of the Mississippi. Subsequent instalments are to describe the medical examinations here, the proposed interchanges, and the general impressions of the delegates.

Deaths in Other Countries

Dr. **J. Federn,** a prominent physician of Vienna through several generations.—Dr. **L. A. de O. Catta Preta,** formerly professor of surgery at the medical school of Rio de Janeiro, president and one of the founders of the Sociedade de Medicina e Cirurgia, president of the first Brazilian medical congress, founder of the Polyclinica de Botafogo, and member of the cabinet during the days of the empire, aged 91.—**Sylvester David Willard,** London, England; M.R.C.S., L.R.C.P., London, 1889; aged 55; died, November 28.

CORRECTION

Some Influences of French Science on Medicine.—In the article by this title appearing first in THE JOURNAL for January 1, the following footnote was omitted: "Read before the Institute of Medicine of Chicago, October 29."

Government Services

REPORTS OF THE SURGEON-GENERALS

United States Army

The report of Surgeon-General Ireland for the fiscal year ending July 1, 1920, is a large volume of 755 pages. In his letter of transmittal, he points out that the major portions of 1919 and 1920 were devoted to demobilization, including physical examination of those discharged, caring for the sick and restoring the wounded, reconstruction of the disabled through vocational and educational training and finally, aiding in building up the new army medical department. The health of the army was satisfactory, modified by the general waning of the influenza epidemic and marked by a gradual decrease in all of the acute infectious diseases. It must be remembered that during this period an army of occupation had been maintained in Germany and expeditionary forces in Siberia and northern Russia. One of the most valuable parts of the report is that on battle casualties. There are numerous tables and charts indicating the relative number of killed and wounded in each branch of the service, time lost, duration of treatment, ultimate results of treatment, etc. A general discussion of the health of the army is followed by special chapters on infectious diseases, venereal diseases and the influenza epidemic. The report of the laboratory division indicates that the army has kept this department of the service at its highest point. Researches have been undertaken on the transmission of disease through kitchen utensils, on carriers of infectious organisms, on the etiology of influenza and on the prevention of diseases through the use of vaccines and serums. During this year the army has inaugurated a commendable feature, the "Medico-Military Review," published twice a month to serve as a medium through which items of current interest and importance are communicated to the medical officers. The Surgeon-General points out the great need for the building for the Army Medical Museum, plans for which have been made. It will be included with the Army Medical School as a part of the medical center to be built on the grounds of the Walter Reed General Hospital. Much space is devoted to the hospital section with its various departments and to an analysis of the personnel of the medical corps and of the reserve corps.

During this year 40,283 books and 5,475 pamphlets were added to the Surgeon-General's Library, which now contains 238,779 bound volumes, 35,496 unbound volumes, 366,295 pamphlets, 6,077 portraits of physicians, 149 medical engravings, and 358 medical caricatures. The library regularly receives, exclusive of transactions of societies, 1,300 current medical periodicals.

A large section of the report is devoted to the work of the forces in France, Germany, Russia and Siberia. Special sections are given to the reports of the department surgeons and to the army general hospitals. The army medical school conducted its twenty-fourth session during this year; thirty-five student officers completed the course and thirty were found proficient and were awarded certificates of graduation. In his conclusion the Surgeon-General expresses the hope that the new building for the Army Medical School and the Walter Reed General Hospital will be completed in time to transfer the activities there for the session of 1922. Courses will be given during the next year at the Field Service Medical School at Carlisle and at the Army Medical School in Washington, D. C. Medical Department administration, sanitary tactics and drill will be reserved for the Carlisle school, as well as hygiene of troops, personal hygiene and field sanitation. At the Army Medical School instruction will be technical and clinical. For the coming session five students have been accepted from the Spanish-American republics and places have been reserved for five officers of the National Guard. Sixty officers will be detailed from civil life or selected from among temporary medical officers, making a total attendance of seventy students.

United States Navy

The report of Surgeon-General Braisted comprises 326 pages and concludes the description of the navy's participation in the war. Peace has not yet restored previous conditions. The navy department also has been suffering from the war reaction and has been having difficulty in securing medical officers. Efforts have been made to increase the attractiveness of the various corps with the hope of attracting more physicians to this service. The Surgeon-General

strongly urges that length of sea service should not be given the same value in estimating the standing of medical officers as it has for other naval officers and he strongly urges periods of study leave after sea service to permit the medical officer to bring himself up to date. He also urges special legislation to permit that temporary officers be given a place in the regular service. The corps at the time of this report had 655 regular medical officers, 107 reserve medical officers, 193 officers holding temporary appointments and 79 former pharmacists commissioned as assistant surgeons. As the authorized strength is 1,225 medical officers, the existing vacancies number 570. The shortage of specialists has induced the bureau to organize special classes at various institutions: surgeons attending the Mayo clinic; eye, ear, nose and throat specialists, the New York Eye and Ear Infirmary and the Washington University, St. Louis, and internists the Pepper Laboratory of the University of Pennsylvania. Students attend these clinics for a period of four months and receive special instruction. Much space is devoted to care of the sick and wounded in the war, to the care of the dead interred abroad, to cooperation with the Bureau of War Risk Insurance, to research carried on in the Navy Medical School, especially into the infectious diseases and diseases of nutrition, and to the course of instruction given at the Navy Medical School. Special sections are devoted to reports from the various ships of the navy together with recommendations. The navy, through the Marine Corps, maintained stations in Nicaragua, Haiti and in the Virgin Islands. In connection with these sections there is particular note of tropical disease investigations.

United States Public Health Service

During the fiscal year covered by the report of Surgeon-General Cumming the bureau has been administered in general under the same divisions as formerly, viz., venereal disease, marine hospitals and relief, scientific research, quarantine, insular quarantine and immigration, sanitary reports, and sections on inspection and public health education. The scientific research division has carried out special investigations of the various infectious diseases, industrial hygiene, sewage disposal, child hygiene, public health organization and general sanitary problems. Among the significant work particularly important were the researches on the various preparations of chaulmoogra oil in leprosy, on the cause and prevention of pellagra, and on the prevention of malaria. The Public Health Service should be given credit for its work on the control of the manufacture and importation of arsphenamin, assuring to America a product possibly superior to that offered previous to the war and at a reasonable price. The service has cooperated with the state of California in investigations on botulism; work has continued as usual on trachoma, typhoid fever and occupational diseases. Special reports are made by each of the various departments and divisions concerning the details of their work. The Public Health Service has held several important conferences, especially the annual meeting with state health officers. In conclusion, the Surgeon-General points out the necessity for legislation defining the limits of activities of the Bureau of War Risk Insurance, the Federal Board for Vocational Education and the Public Health Service. Many of the duties of these organizations now overlap. Additional appropriations are asked to permit investigation by the service into the spread of infectious disease, for the control of plague and for the improvement of quarantine service, particularly at Providence, R. I., and at Mobile, Ala. It is desired to extend the educational service, especially the carrying of messages of public health by circulars, lectures and lantern slides. It is strongly recommended, because of crowded conditions at headquarters, that steps be taken to locate all of the activities of the Public Health Service in one building of permanent fireproof construction. Legislation is needed also to permit the bureau to secure sufficient personnel and to extend its reserve corps.

Reorganization of Government Departments

The Smoot-Reavis bill for the reorganization of the various departments of the government has become a law without the President's signature, and the joint congressional committee will at once begin its survey of the departmental operations. While it is too early to predict what changes will be made in the health activities of the various departments, it is within the power of the committee to effect a unified system whereby many bureaus may be consolidated, unnecessary duplication eliminated, and the work of the government in public health lines brought under one department.

APPROPRIATIONS FOR MEDICAL ACTIVITIES

Medical History of the World War

The Sundry Civil Appropriation Bill, just reported to the House, contains an item of $50,000 for continuing the work of compiling the medical history of the World War, which is under the direction of Surgeon-General Ireland and Col. Charles Lynch.

Fate of Interdepartmental Social Hygiene Board

The Interdepartmental Social Hygiene Board requested $2,246,924 to carry on its work against venereal diseases during the next fiscal year, but the appropriation was entirely eliminated from the Sundry Civil Bill by the House Committee on Appropriations. This board will cease to function unless the Senate provides the necessary funds, which in the present year amounted to $1,015,000. Opposition to the continuation of the board is attributed in part to the fact that it duplicates work performed by the Public Health Service.

Public Health Service Activities

The bill authorizes the expenditure of $200,000 by the division of venereal diseases of the Public Health Service, although $336,715 was requested for the next fiscal year. The bureau asked for $50,000 for health education, and $200,000 for the control of influenza and other epidemic diseases, but these amounts were refused. The House Committee granted only $50,000 for the control of biologic products, the amount allotted during the current fiscal year.

The sum of $80,000 is provided for the maintenance of a home for lepers, including transportation of lepers, maintenance and care, and pay of necessary officers. This home has been located at Carville, La.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 13, 1920.

New Legislation for Sexual Offenses

A criminal law amendment bill, introduced by the government, makes important modifications in the law on sexual offenses and also provides for the care of young persons who may be the subject of such offenses. If it appears to the court that any person under the age of 16 with or on whom the offense has been committed requires by reason of character, conduct or associations care, supervision or control, the court may: (1) order that person's parent or guardian to enter into a recognizance to exercise due care and supervision in respect of that person; (2) make an order of committal to the care of a relative or other person named by the court; or, if the person with respect to whom the order is proposed is under 14 years, to an industrial school, and the provisions of the children's act of 1908 shall apply to such order. The court may also in the case of children under 14 place them under the supervision of a probation officer. Another clause is added to prevent the use of ships in harbor as resorts of prostitutes. It reads: "A prostitute shall not enter or be on board any ship or vessel in any port, dock or harbor for the purpose of prostitution, and a person shall not take any prostitute on board for such a purpose. The penalty is a fine not exceeding $10 or imprisonment with or without hard labor for a month. It shall be the duty of every port, dock and harbor authority to take all reasonable steps to prevent persons resorting to these places or to ships for the purpose of prostitution." Another clause inflicts penalties for false accusation: "If any person accuses another person of any offense under the act, knowing the accusation to be false or not having reasonable grounds for believing it to be true, he shall be liable to imprisonment with or without hard labor for a term not exceeding two years or to a fine not exceeding $250." Drastic penalties are imposed on persons soliciting sexual intercourse knowing that they are suffering from venereal disease in a communicable form.

Industrial Fatigue in Boot and Shoe Factories

The Industrial Fatigue Research Board has issued a report on the boot and shoe industry which derives special interest from the fact that this is one of the "consumptive industries," like stone cutting and printing. The Medical Research Committee recently reported that the boot worker is predisposed to infection by the sedentary nature of his employment and possibly by the attitude he adopts at his work, and that the infection is probably increased by the number of infected workers and is favored by lack of light, by infected dust and by inadequate ventilation in workrooms. It has consequently recommended that lighting, floor cleaning and ventilation shall be improved in the factories, and that periods of rest and exercise shall be instituted. The evidence obtained from a factory in which such play intervals had been instituted disclosed that they are of economic as well as hygienic advantage. More and better work is done than without such intervals. It was considered contrary to physiologic doctrine and to economic efficiency to keep girl machinists sitting at a bench for an unbroken spell of four hours. This was in 1912. The war came, and all hope of applying these views had to be abandoned. But in 1918 a certain boot-making firm was confronted with the problem of increasing output without adding new machinery, owing to the difficulty of obtaining machinery at that time. The difficulty arose in the "press room" where the leather is cut into pieces by a mechanical press working a heavy knife—an operation demanding skill and care. It was resolved to give the system of rest pauses a trial and thus attempt to get more out of the machinery. The advice that had been offered in 1913 in the interest of health was taken in 1918 in the interest of output. The view of the physicians that more and better work would be done with such intervals proved correct. The experiment was made of working with a team of three girls, each working forty minutes in each hour and resting twenty minutes. The earlier method was to work with two girls who carried on continuously during the day. The results were so favorable that the system was adopted. The rest room provided was comfortable, quiet, and attractively furnished. The girls could do there as they pleased—knit, crochet or read. Payment was by the day plus a bonus on output. The increased output on different machines varied from 34 to 75 per cent. and averaged 44 per cent. Yet the working hours of the individual were reduced by one third. The effect on the workers was carefully noted. At first they viewed the experiment with skepticism and thought they could not get through their work. But when they found the result they became enthusiastic. Moreover, they said that their health improved and that they no longer felt tired after the day's work. This applied especially to the weak and unskilful. Efforts were also made to determine the best working period for the industry. Saturday labor was found to be defective. In only one factory was the output 90 per cent. of the other days, and in one it was only 77 per cent. Some manufacturers, recognizing that Saturday work was not profitable, abandoned it. The fear then arose that Friday's output might then suffer, but this fear proved unfounded. With regard to Saturday labor, it was also found that the fall was less in the case of the more skilled operatives.

A Physiologist Appointed Director of a Clinical Medical Unit

A significant appointment has been made to the Clinical Medical Unit of St. Thomas' Hospital and one so far unique in this country. Dr. Hugh Maclean, professor of chemical pathology in the University of London, has been appointed director. He is well known for his writings on this subject. The appointment of a physiologist and biochemist to direct clinical teaching shows forcibly the trend of modern medicine.

PARIS

(From Our Regular Correspondent)

Dec. 3, 1920.

Recognition Throughout French Territory of Physicians and Dentists of Alsace-Lorraine

In a previous letter (THE JOURNAL, July 17, 1920, p. 187), I called attention to the peculiar situation in which Alsatian physicians find themselves at present. Although a number of these physicians, during the war, practiced in France among the civilian population and in the Red Cross hospitals, they are nevertheless treated as foreign physicians and are now authorized to practice only in Alsace and Lorraine. In order to remedy this deplorable state of affairs, the government has filed this bill with the chamber of deputies:

Section 1. Physicians who have been duly authorized to practice medicine in Alsace-Lorraine and who have been admitted to the rights of French citizenship shall have the privilege of practicing medicine throughout all French possessions under the same conditions as those who have received diplomas in medicine from the French government.

Section 2. Dentists who have received diplomas, in accordance with the local regulations in force in Alsace-Lorraine, entitling them to the designation "Zahnarzte," and who have been admitted to the rights of French citizenship, shall have the privilege of practicing the profession of dentistry throughout all French possessions under the same conditions as those who have received their dental diplomas from the French government.

International Congress of Medicine and Pharmacy as Applied to War

The Medical Corps of the Belgian army is organizing at Brussels for the month of June, 1921, an international congress of medicine and pharmacy as applied to war, to which all the physicians and pharmacists belonging, or who formerly belonged, to the armies of allied and neutral countries are invited. Questions that will come up for discussion are: (1) What the war has taught us in regard to the treatment of fractures of the extremities; (2) the campaign against venereal disease and tuberculosis in the army; (3) chemical and physical study of war gases; sequels of the action on the organism; significance of these sequels in the evaluation of disability claims, and (4) plan of organization of army medical corps, in general. Registrations for the congress, and the communications on the questions to be discussed, should reach the general secretary of the congress, M. Jules Voncken, hôpital militaire de Liége, Belgium, by April 1, 1921. Articles should be accompanied by a concise summary of their contents.

Antigens and Antibodies

Dr. Maurice Nicolle, of the Pasteur Institute in Paris, conceived the excellent idea of combining under this title and of publishing in the form of a small volume (Masson et Cie, publishers) the substance of the three Harben lectures, which had been desired in book form by the Royal Institute of Public Health, London. The interesting features of the work are the diagnostic and therapeutic applications of the ideas concerning antigens and antibodies. From the standpoint of serotherapy, Nicolle passes in review antipneumococcus serums, antimeningococcus serums, antigonococcus serums and antityphoid serums. In vaccinotherapy he discusses the indications for vaccines, their mode of action and their therapeutic effects.

Marriages

JOSEPH S. PARENT, Galway, N. Y., to Miss Bessie M. Wright of New York, at Bennington, Vt., June 10.

ROY CHESTER LOWE, Evansville, Ind., to Miss Marie Whitaker of Indianapolis, December 18.

JOHN RILEY MERRIMAN, Springfield, Ill., to Miss Dorothy Carroll of New York, October 27.

WILLIAM LEVINE to Miss Kate L. Stivelman, both of Brooklyn, November 28.

Deaths

Orlando Benajah Douglas, Concord, N. H.; University of the City of New York, 1877; aged 84; a member of the New Hampshire Medical Society; a veteran of the Civil War; for many years surgeon and director of the Manhattan Eye, Ear and Throat Hospital; president of the New Hampshire Orphan's Home; at one time president of the Medical Society of the County of New York, and for ten years treasurer of the New York Academy of Medicine; died, December 17.

Walter Jackson Freeman ● Philadelphia; University of Pennsylvania, Philadelphia, 1885; College of Physicians and Surgeons in the City of New York, 1885; aged 60; laryngologist to the Pennsylvania Institution for the Deaf and Dumb and the Orthopedic Hospital; a member of the American Laryngological Association and of the College of Physicians of Philadelphia; died, December 20.

Edward Herbert Thompson, Bluefield, W. Va.; Maryland Medical College, Baltimore, 1905; aged 33; a member of the West Virginia State Medical Association; secretary of Mercer County Medical Society since 1917; a member of the state board of health; died, December 14, from injuries received in an automobile accident.

Worthington Warner Miner ● Ware, Mass.; University of Buffalo, N. Y., 1871; aged 73; for twenty-five years local surgeon for the Boston and Maine Railroad; at one time a member of the Ware school board and board of health; at one time associate editor of the *Buffalo Medical Journal;* died, December 12, from anemia.

Andrew William Hoisholt ● Napa, Calif.; Cooper Medical College, San Francisco, 1882; University of Heidelberg, Germany, 1884; aged 62; clinical professor of medicine in Leland Stanford Junior University, San Francisco; medical superintendent of Napa State Hospital; died, December 17, from heart disease.

William Francis M. Sowers, Washington, D. C.; Johns Hopkins University, Baltimore, 1900; aged 46; a member of the surgical staff of Providence, George Washington and Foundling hospitals; a member of the Washington (D. C.) Surgical Society; died, December 19.

William Jonathan Swift, New York; College of Physicians and Surgeons of the City of New York, 1878; aged 68; a member of the Medical Society of the State of New York; visiting physician at the Manhattan Eye and Ear Hospital, New York Eye and Ear Infirmary, and Bellevue Hospital; died, December 20.

Oscar Franklin Kunkel ● Bells Camp, Pa.; Jefferson Medical College, 1903; aged 40; for ten years medical director of Bon Air Sanatorium, Bells Camp; a member of the National Association for the Prevention of Tuberculosis; died, December 17, from tuberculosis.

George Oliver Coffin, Kansas City, Mo.; Kansas City (Mo.) Medical College, 1892; aged 42; at one time clinical surgeon to Kansas City General and St. Joseph's College Hospital; at one time city physician of Kansas City; died at the Bonner Springs Sanitarium, December 11.

James Thomasson Morehouse, West Orange, N. J.; University of the City of New York, 1893; aged 63; for nearly twenty-five years specializing in roentgen-ray work; died in the New York Hospital, December 20, following an operation for roentgen-ray dermatitis.

Edgar U. Parsons, Piedmont, W. Va.; Medical College of Virginia, Richmond, 1865; aged 82; a member of the West Virginia State Medical Association; surgeon in the Confederate service during the Civil War; died, December 20.

Sam W. McFarland ● Lebanon, Tenn.; University of Nashville, Tenn., 1901; aged 40; a specialist in surgery; founder and superintendent of the McFarland Infirmary, Lebanon; died suddenly, December 15, from cerebral hemorrhage.

Lewis F. Tague, Belleville, Ill.; University Medical College of Kansas City, 1909; aged 47; a member of the Illinois State Medical Society; died in St. Vincent's Hospital, St. Louis, December 17, from an accidental gunshot wound.

Helen Josephine LeMaistre, Tuscaloosa, Ala.; Woman's Medical College of Pennsylvania, Philadelphia, 1914; aged 38; instructor in hygiene and physical adviser to women students at University of Alabama; died, December 11.

Arthur P. Rooney ● Harlem, Mont.; Chicago Medical College, 1897; aged 51; local surgeon for the Great Northern Railroad; died in St. Mary's Hospital, Rochester, Minn., December 10, following an operation for gallstones.

Alvah Giles Floyd ● Fair Bluff, N. C.; University of Maryland, Baltimore, 1885; aged 60; a practitioner for thirty-five years; president of the Columbus County Medical Society in 1919; died, December 14, from cerebral hemorrhage.

Robert Stevens Page, Bel Air, Md.; University of Maryland, 1898; aged 46; a member of the Medical and Chirurgical Faculty of Maryland; died at the Union Memorial Hospital, Baltimore, December 2.

William Edmunds Kerr, Steubenville, Ohio; Jefferson Medical College, Philadelphia, 1903; aged 43; physician and surgeon for the city police and fire departments; died, December 10, from pneumonia.

Edward S. Sharpless, San Francisco; Hahnemann Medical College and Hospital of Philadelphia, 1880; aged 67; died in Hahnemann Hospital, San Francisco, October 20, from chronic nephritis.

Charles A. Labenberg ● Richmond, Va.; University College of Medicine, Richmond, 1896; aged 44; at one time lecturer on materia medica and therapeutics in his alma mater; died, December 16.

Thresa Chestro Snyder Hofmann, Mayfield, Calif.; Ohio State University, Columbus, 1912; aged 32; for six years a medical missionary in China; died, November 2, from cerebral hemorrhage.

Mary A. Quincy ● Ashland, Neb.; University of Nebraska, Omaha, 1896; aged 63; secretary of the Saunders County Medical Society since 1914; died, December 7, from influenza.

Francis B. Norton ● Cleveland; Western Reserve University, Cleveland, 1875; aged 72; for thirty-five years police surgeon of Cleveland; died, December 17, from heart disease.

Oliver C. Buster, Pilot Point, Texas; St. Louis College of Physicians and Surgeons, 1887; aged 74; a member of the State Medical Association of Texas; died, October 1.

Ralph Henry Sill ● Cleveland; Western Reserve University, Cleveland, 1905; aged 40; captain, M. C., U. S. Army, and discharged, July 8, 1919; died, November 23.

William George Reynolds, Woodbury, Conn.; Yale University, New Haven, Conn., 1897; aged 49; a member of the Connecticut State Medical Society; died recently.

William T. O'Brien, Ashland, Wis.; College of Physicians and Surgeons, Chicago, 1891; aged 59; a member of the State Medical Society of Wisconsin; died, December 20.

Wilbur Burton Morris, Chalmers, Ind.; University of Louisville, Ky., 1898; aged 48; died at the Home Hospital, Lafayette, December 9, from uremia.

Albert W. Thompson, Bristolville, Ohio; Western Reserve University, Cleveland, 1874; aged 75; died, December 15, from cerebral hemorrhage.

Colley J. Miller, Haddenville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1892; aged 50; died, September 11, from diabetes.

Benjamin Willis Cornwell ● Buffalo and Williamsville, N. Y.; University of Buffalo, 1885; aged 58; died in Buffalo, November 27.

Edwin Fayette Smith, Morristown, N. J.; College of Physicians and Surgeons in the City of New York, 1876; died, December 13.

Charles E. J. Froatz, New York; Bellevue Hospital Medical College, 1892; aged 51; died, September 25, from necrosis of the jaw.

George W. Murphy ● Sioux City, Iowa; State University of Iowa, Iowa City, 1888; aged 61; died, December 13, from carcinoma.

James Bedford Lockridge, Minnehaha Springs, W. Va.; University of Maryland, Baltimore, 1885; aged 58; died recently.

William Dickie Richmond ● Knoxville, Tenn.; University of Pennsylvania, Philadelphia, 1903; aged 47; died, December 18.

John Peter Sheehan, Utica, N. Y.; Kentucky School of Medicine, Louisville, Ky., 1894; aged 52; died, November 16.

Newton D. Boddie, Chipley, Ga.; Atlanta (Ga.) Medical College, 1888; aged 54; died, November 20, from gastritis.

David A. Philips, Linesville, Pa.; Western Reserve University, Cleveland, 1867; aged 80; died, December 3.

Philip Cogan, St. Louis; Missouri Medical College, St. Louis, 1890; died, December 18.

● Indicates "Fellow" of the American Medical Association.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE FRAUD ON THE PUBLIC AND ON THE PROFESSION

MORE MISBRANDED VENEREAL NOSTRUMS

Saxon Gonorrhea Injection.—The Saxon Co., Cleveland, Ohio, shipped in June, 1919, a quantity of "Saxon Gonorrhea Injection" which was declared misbranded. The Bureau of Chemistry reported that analyses showed this to consist essentially of a solution of salts of lead and zinc, with berberin, in water. It was falsely and fraudulently represented as a treatment, remedy and cure for gonorrhea, gleet and the prevention of stricture. In January, 1920, a decree of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 7797; issued Nov. 26, 1920.*]

Santalets.—In November, 1919, the United States attorney for the District of Minnesota filed a libel for the seizure and condemnation of 20 bottles of "Santalets" shipped, it was alleged, in January, 1916, by Sharp & Dohme, Baltimore, and which the government officials charged were misbranded under the Food and Drugs Act. The Bureau of Chemistry reported that analysis showed the product to consist of capsules containing santal oil. The preparation was falsely and fraudulently represented as a treatment, remedy and cure for gonorrhea, gleet, catarrh of the bladder—acute or chronic—whether due to gonorrheal infection or other causes. In March, 1920, no claimant having appeared for the property, a decree of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 7799; issued Nov. 26, 1920.*]

Specific Globules 37-77.—In July, 1919, the United States attorney for the Southern District of California filed a libel for the seizure and condemnation of 4 gross cartons of Specific Globules 37-77 on the charge that they were misbranded. The preparation is alleged to have been shipped in August, 1918, by Sharp & Dohme, Baltimore, Md. The analysts of the Bureau of Chemistry reported that the article was found to consist of gelatin capsules, containing essentially a mixture of copaiba, cubebs, santal oil and salol. The following claims for this product were made in or on the trade packages:

"An improved combination in capsule form for the treatment of gonorrhea and its complications."

"These Capsules stand in a class by themselves for the treatment of Gonorrhea, Gleet, Stricture, or prolonged discharge . . . for the treatment of Urinary diseases. . ."

These claims were declared false and fraudulent in that the packages "contained no ingredient or combination of ingredients capable of producing the therapeutic effects" claimed. In September, 1919, judgment of condemnation and forfeiture was entered and the court ordered that the product might be released to the Chambers Drug Co., the claimant, on payment of the proceedings and the execution of a bond of $300, conditioned in part that the product be relabeled under the supervision of the United States Department of Agriculture.—[*Notice of Judgment No. 7804; issued Dec. 8, 1920.*]

Saxon Methygon Tablets.—The Saxon Co., Cleveland, Ohio, consigned in June, 1919, a quantity of Saxon Methygon Tablets which were misbranded. Analyzed by the Bureau of Chemistry, these tablets were reported to consist essentially of methylene blue. Among other claims made for them were:

"A reliable remedy for treating Gonorrhea and Gleet. Splendid results are obtained if used in connection with Saxon Gonorrhea Injection."

"If Taken According to Directions, Methygon Tablets Will Prove Effective Where Other Preparations Fail."

These and other claims were declared false and fraudulent and, in January, 1920, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 7810; issued Dec. 8, 1920.*]

Columbia Short Stop.—In December, 1917, and April, 1919, the Columbia Drug Co., Savannah, Ga., consigned a quantity of this product to Jacksonville and Tampa, Fla. The Bureau of Chemistry reported that the stuff consisted essentially of santal oil, copaiba, turpentine, gum acacia, ethyl nitrite and alcohol, flavored with oil of lavender. It was falsely and fraudulently recommended for "Gonorrhea, Gleet, Running Range, Inflammation of the Kidneys and Bladder." In June, 1919, the court entered judgment of condemnation and forfeiture and ordered that the product be delivered to the claimant upon payment of the cost of the proceedings and the execution of certain bonds.—[*Notice of Judgment No. 7811; issued Dec. 8, 1920.*]

Allan's Compound Extract of Sarsaparilla with Iodids.—In June, 1919, the Allan-Pfeiffer Chemical Co., St. Louis, consigned a quantity of this product to a concern in Illinois. When analyzed, the stuff was found by the Bureau of Chemistry to consist essentially of a laxative plant drug, plant extractives, sodium salicylate, a small amount of potassium iodid, glycerin, sugar, alcohol and water. Some of the false and fraudulent claims made for the nostrum were to the effect that it is the best known remedy for syphilis, that it was a powerful purifier of the blood and that it had various other curative and therapeutic effects. In December, 1919, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 7812; issued Dec. 8, 1920.*]

Methylets.—In March, 1916, a quantity of "Methylets" were alleged to have been shipped from Illinois to Minnesota. The article was labeled in part "Sharp & Dohme's Methylets. . . . Manufactured only by Sharp & Dohme, Baltimore." The Bureau of Chemistry reported that analysis showed the product to consist of gelatin capsules containing a mixture of methylene blue, santal oil, copaiba, and oil of cinnamon. Among the claims made on the trade package for this product were:

". . . of great value in all forms of urethritis—especially gonorrheal and allied varieties."

"It shortens the duration, lessens the severity, and renders complications less frequent and protracted."

"In the numerous complications of Gonorrhea that attack the remainder of the genital tract, kidneys, and bladder, one Methylet three times a day will be sufficient."

These and similar claims were declared false and fradulent and in March, 1920, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 7815; issued Dec. 8, 1920.*]

Bonkocine.—A quantity of this product consigned by J. E. Gasson, Kenton, Ohio, and shipped in March, 1919, was seized on the charge that it was misbranded. The Bureau of Chemistry reported that analysis showed "Bonkocine" to consist essentially of a watery solution of Epsom salt and berberin. The trade package contained such claims as:

"Well Defined Cases of Gonorrhea yield to treatment in 1 to 5 days; Chronic Gonorrhea and Gleet in 5 to 10 days, provided they are not complicated with Stricture or Enlarge Prostate Gland."

"Leucorrhea or Whites, Female Disease . . . Bonkocine has proven itself the best remedy for this disease."

"As a Preventative Bonkocine used after an intercourse prevents the contracting of either Syphilis or Gonorrhea. It effectually eradicates both Syphilitic and Gonorrheal virus."

These claims were, naturally, declared false and fraudulent and applied with a knowledge of their falsity for the purpose of defrauding the purchasers. In February, 1920, judgment of condemnation and forfeiture was entered and it was ordered by the court that the product be destroyed.—[*Notice of Judgment No. 7816; issued Dec. 8, 1920.*]

Correspondence

EARLY USE OF IPECAC IN DYSENTERY

To the Editor:—A short time ago I saw in a medical journal an article in which the author described his method of treating dysentery, which consisted of giving 30 grains of ipecac at one dose, preceded by a hypodermic of one-eighth grain of morphin, and then placing the patient on the right side and urging him to lie still.

Since then I chanced to pick up a volume of "A Treatise of the Materia Medica and Therapeutics," by John Eberle, M.D., printed in 1824. In Volume 1, pages 40 and 41, I found: "Piso, as early as 1649 and before any of it had been brought to Europe, mentioned the ipecacuanha as a common remedy for dysentery, in the Brasils. . . . Mr. Playfair, in a paper in the tenth volume of the *Edinburgh Medical and Surgical Journal*, has given an account of a new method of using ipecacuanha in dysentery, and which he states to have proved exceedingly successful. He gave from half a drachm to a drachm of this article, in union with from thirty to sixty drops of laudanum, keeping the patient for some time in the horizontal position." This was published in 1801.

How often do we find that our new discoveries are only just finding something that the old fathers in medicine knew and practiced long ago. They had never seen an ameba in the stools of a patient with dysentery, but they had the treatment correct. Are we, in our refinements of diagnosis, losing the skill we ought to have in our work? This is not written to criticize the doctor's article in the least, but to keep the history of medicine straight.

F. S. SMITH, M.D., Nevada, Iowa.

THE PROPER RECOGNITION OF THE LABORATORY TECHNICIAN

To the Editor.—During the last few years a remarkable development of the so-called "clinical laboratory" has taken place. The number of these institutions has now become so large that it is practically impossible to find a sufficient number of men, medically trained, to supply the demand for technicians. Laboratory directors have therefore been compelled to fall back on the services of nonmedical technicians for much of their routine work. The services of laboratory technicians are quite satisfactory, dependent, however, entirely on their training and temperament. Certain questions confront us in employing these people: What preliminary education have they had; What has been the character of their strictly technical education? How much practical experience have they had in routine clinical pathology? We find, first, that there is a constantly increasing demand for technicians; secondly, that they come with various kinds of recommendations, seldom with a certified account of their training and experience. It is often necessary to take them into the laboratory and spend much time ascertaining their exactitude in technic, their carefulness, their manner of procuring specimens, etc. At times we find that they are totally unfit to be entrusted with the important matters that constitute the everyday routine of the laboratory.

During the late war, the army required the services of many technicians, and established training schools before enlisting them in the service. This was an excellent plan. The time has now come when it is imperative to establish schools for the proper training of technicians and for the organization of some kind of board or tribunal before which the graduate technician must appear to prove his or her qualifications for employment.

Our purpose in bringing this matter before the profession is, first, to call attention to the necessity of using these nonmedical persons in this kind of work; secondly, to urge the need for their better training, and thirdly, to urge the advisability of instituting some kind of board before which graduate technicians must appear and prove their qualifications for employment. This will be a protection both for the properly trained technicians and for their future employers. At the same time it will result in better laboratory work and assist in the upbuilding of this specialty. Technicians have come to stay; it therefore behooves those who need their services to assist them in attaining the highest degree of efficiency and in constantly keeping them informed of the latest advances in laboratory procedure. To the end, too, that a better class of women be urged to enter this field, it is suggested that the organizations of women's clubs, etc., be informed of the possibilities for women in a career of this kind so that the best possible raw material may be selected and utilized in the upbuilding of this highly technical branch of medical specialism. Those who have seriously entered this work surely deserve some sort of recognition by the medical profession, and that recognition can come only through the official endorsement of a "laboratory examining board" of some kind. Perhaps the formation of some kind of national association by the technicians themselves might well take up the matter and bring about just what we have suggested.

R. B. H. GRADWOHL, M.D., Chicago.

"CHRONIC PELVIC PERITONITIS OF UNKNOWN ETIOLOGY OCCURRING IN WOMEN"

To the Editor.—In his article in THE JOURNAL, Dec. 11, 1920, p. 1641, Dr. Geist describes a number of cases characterized by adhesions. I believe it is a faulty premise to presume that all adhesions are inflammatory in origin. It is now generally believed that the so-called Jackson's membrane, Lane's kink, and sigmoidal and some cholecystic bands are congenital in origin, owing to migration of the organs, together with faulty peritoneal fusion. They have all been frequently demonstrated in embryo. They do not have the general appearance of inflammatory adhesions, nor do they show the microscopic picture of these. Dr. Geist has not found any historical, bacterial or pathologic evidence of inflammation in his cases. Furthermore, I believe we have all encountered these fine velamentous adhesions binding down the uterus and tubes, and were satisfied to consider them inflammatory. Of course, they can and do produce symptoms, particularly of sterility and malposed organs. I would therefore suggest that these cases should not be termed pelvic peritonitis, as there is no evidence of inflammation, but rather should be grouped under those of congenital bands.

HERBERT E. STEIN, M.D., New York.

To the Editor:—In THE JOURNAL, Dec. 11, 1920, p. 1641, Dr. Geist describes four cases presenting a rather characteristic clinical picture and definite pathologic findings, without any demonstrable etiologic factor. Commenting on the etiologic possibilities in the production of extensive periadnexal adhesions, Dr. Geist says: "That there must be or must have been a source of irritation is undoubted, but the type of irritation is difficult, and in my four cases impossible to determine. Naturally a possible infection must be considered, but in none of the cases was a history of any type of infection obtainable." He concludes that this condition of pelvic inflammation does not fit into the classification of pelvic infections as we now understand them.

The negative clinical history, the insidious course, the symptomatology and the operative findings as detailed by Dr.

Geist are typically characteristic of periadnexitis resulting from chronic endocervicitis. The pathologic process is chronic ascending lymphangitis (not a peritonitis) with its source in a chronic infection within and limited to the endocervical mucosa. A full and detailed elaboration of the condition may be found in "Gynoplastic Technology" (Philadelphia, F. A. Davis Company, 1919, pp. 32-88) and previous articles on "Tracheloplasty" and "Endocervicitis" (*Surg. Gynec. & Obst.* **22**:93 [Jan.] 1916; *Tr. Sect. Obst., Gynec. & Abd. Surg. A. M. A.*, 1917, p. 42).

The vital importance of these newer views on the subject lies in their therapeutic application, for no method of intra-abdominal attack on the results of chronic endocervicitis, namely, periadnexitis, will or can cure the patient unless the endocervical focus is eradicated; while, on the other hand and what is more important, a timely eradication of an infected cervical mucosa will, if thoroughly executed, obviate any and every further attack on the adnexa.

ARNOLD STURMDORF, M.D., New York.

"WHAT FASTING MEANS"

To the Editor:—The editorial on "What Fasting Means" (THE JOURNAL, Oct. 23, 1920, p. 1138) leaves the impression that the question of the persistence of hunger in man has not been experimentally determined for longer fasts than five days. In the *American Journal of Physiology* (**45**:81 [Jan.] 1918) I reported experiments on man showing that "during fifteen days' complete fast the gastric hunger contractions continue with practically normal rhythm and intensity, but the subjective sensations induced by these stomach contractions appear to be somewhat weakened and tinged with an element of general epigastric distress or 'sick stomach.'"

In earlier experiments on dogs (*Am. J. Physiol.* **33**:95, 1914) I showed that the gastric hunger contractions increase in vigor, at least up to the tenth day of fasting. Later, Dr. Patterson, working in our laboratory, showed that in dogs the gastric tonus and hunger contractions persist and even increase in strength during fasting until within a few hours of death from starvation (*Am. J. Physiol.* **37**:324, 1915). The same author has reported that in fasting turtles the gastric hunger contractions exhibit a progressive increase in vigor for the entire fasting period, sixty-four days (*Am. J. Physiol.* **43**:56 [Dec.] 1916).

A. J. CARLSON, PH.D., Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

EFFECT OF BIRTH CONTROL ON THE INCOME OF PHYSICIANS

To the Editor:—HAS THE JOURNAL ever published a discussion of the effect that birth control has or would have on the income of physicians? Any information you may be able to give me upon this subject will be thankfully received.

C. W. C., New Jersey.

ANSWER.—We have no reference to any article on the effect which birth control would have on the income of physicians. The social aspects of this measure in relation to the general population are so broad that the relative importance of any effect it might have on the income of physicians is infinitesimal.

Maternal Deaths.—Year by year about 15,000 mothers have been dying in the United States in childbirth from causes which are largely preventable. The new figures now published by the Census Bureau for 1916 (16.3 per thousand) indicate that since 1900 no decrease in maternal deaths had yet taken place.—*Connecticut Health Bull.*, October, 1919.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 11. Sec., Dr. Samuel W. Welch, Montgomery.
CALIFORNIA: Los Angeles, Feb. 14-17. Sec., Dr. Charles B. Pinkham, 127 Butler Bldg., San Francisco.
DISTRICT OF COLUMBIA: Washington, Jan. 11-13. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.
HAWAII: Honolulu, Jan. 10-13. Sec., Dr. J. E. Strade, 1041 Alakea St., Honolulu.
INDIANA: Indianapolis, Jan. 11. Sec., Dr. W. T. Gott, Crawfordsville.
KANSAS: Topeka, Feb. 8. Sec., Dr. Henry A. Dykes, Lebanon.
MISSOURI: St. Louis, Jan. 18-20. Sec., Dr. George H. Jones, Jefferson City.
NATIONAL BOARD OF MEDICAL EXAMINERS, St. Paul, Minneapolis and Rochester, Minn., Feb. 23-March 2. Sec., Dr. J. S. Rodman, 1310 Medical Arts Bldg., Philadelphia.
NEW MEXICO: Santa Fe, Jan. 10-11. Sec., Dr. R. E. McBride, Las Cruces.
NEW YORK: New York City, Albany, Syracuse and Buffalo, Jan. 24-27. Asst., Professional Examinations, Mr. Herbert J. Hamilton, State Education Bldg., Albany.
OKLAHOMA: Oklahoma City, Jan. 11-12. Sec., J. M. Byrum, Shawnee.
PENNSYLVANIA: Philadelphia, Jan. 11-15. Sec., Dr. Thomas E. Finnegan, Harrisburg.
SOUTH DAKOTA: Pierre, Jan. 18. Director, Division of Medical Licensure, Dr. H. R. Kenaston, Bonesteel.
VERMONT: Burlington, Feb. 8-10. Sec., Dr. W. Scott Nay, Underhill.
WEST VIRGINIA: Charleston, Jan. 13. Sec., R. T. Davis, Charleston.
WISCONSIN: Madison, Jan. 11-13. Sec., Dr. John M. Dodd, Ashland.

Wyoming June Examination

Dr. J. D. Shingle, secretary, Wyoming State Board of Medical Examiners, reports the written examination held at Cheyenne, June 7-9, 1920. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 6 candidates examined, 5 passed and 1, an osteopath, failed. Twenty-four candidates were licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
University of Colorado School of Medicine		(1901)	*
Loyola University School of Medicine		(1917)	76
Hospital College of Medicine, Louisville		(1898)	76
Marion-Sims College of Medicine		(1896)	81
St. Louis College of Physicians and Surgeons		(1919)	75

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Bennett Coll. of Eclectic Medicine and Surgery		(1907)	Arizona
Chicago College of Medicine and Surgery		(1914), (1917)	Illinois
College of Physicians and Surgeons, Chicago		(1901)	Illinois
Loyola University School of Medicine		(1916)	Illinois
Northwestern University Medical School		(1907), (1920)	Illinois
Rush Medical College		(1917)	Illinois
University of Illinois College of Medicine		(1911)	Illinois
Keokuk Medical College, Coll. of Phys. and Surgs.		(1905)	Iowa
Tulane University of Louisiana		(1912)	Kansas
Harvard University Medical School		(1918)	Mass.
Detroit College of Medicine and Surgery		(1920)	Michigan
American Medical College, St. Louis		(1896)	Iowa
National University of Arts and Sciences		(1913)	Missouri
St. Louis College of Physicians and Surgeons		(1906)	Iowa
St. Louis University School of Medicine		(1903)	Illinois
University Medical College of Kansas City		(1904)	Indiana
John A. Creighton Medical College		(1918)	Nebraska
University of Nebraska College of Medicine		(1903), (1916) (1919)	Nebraska
University of Pennsylvania		(1910), (1917)	Penna.

*No grade given.

Montana October Examination

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held at Helena, Oct. 5-7, 1920. The examination covered 10 subjects and included 50 questions. An average of 75 per cent. was required to pass. Of the 11 candidates examined, 10 passed and 1 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
University of Colorado		(1920)	77.6
Northwestern University Medical School		(1920)*	75.2
Rush Medical College		(1917), (1920)	81.4, 85.5
University of Illinois		(1917) 82, (1920)	76.9
University of Michigan		(1920)	81.5
University of Minnesota Medical School		(1920)*	80.4
University of Pennsylvania		(1920)	77.8
	FAILED		
University of Maryland		(1911)	71.7

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Social Medicine and Medical Economics

RELATIONS BETWEEN PHYSICIANS IN INDUSTRY AND GENERAL PRACTICE *

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In discussing the relations between medical men in industry and in general practice, one might be easily led astray into the problems of legislation and, in so doing, completely lose sight of the necessity of giving real thought to the best methods of establishing proper relations under the laws as they exist. In this presentation we have intentionally avoided a discussion of the merits of legislation—of changes that might be made in legislation, such as those that would be to the better interest of the patient and more equitable for all the medical men. The legislative aspect of this question might well consume all the time that has been allotted for this paper. Our presentation is more a delineation of the way in which physicians in industry and those in general practice have worked out their relations, than an effort to solve for all time and under all conditions what these relations should be.

FUNDAMENTAL CONSIDERATIONS

Of prime importance in working out these relations is an earnest desire on the part of both parties to try to solve the problem, to give and take during its period of solution, and to maintain the frankest relations possible.

Secondly, it must be constantly borne in mind that the ethics of the profession is equally binding on the physician in industry and the physician in general practice. Merely because he is not so dependent on the general public, merely because he is having his bills paid by a manufacturer, merely because the losing of an individual patient does not affect his income, the man in industry is not relieved of his obligation to maintain the highest standard of professional practice.

It is our belief that anything except voluntary visits to the physician in industry tends toward the lowering of the standard of practice. It is our belief that it is the inalienable right of every American, be he working man or executive, to have the physician of his own choice. No employer has any right to force a working man to accept medical attention against his will. If the physician in industry is to get the business of the employee there is only one fair way to do it—that is, by using professional means of making himself the physician of that person's choice.

There are two distinct plans now in vogue for operating medical departments in industry: one in which the employer undertakes it as a type of charity and a gift to his employees and their families, and the other in which he installs the medical department on the basis of its being a means of keeping his working force as productive as possible. The conduction of a medical department on the basis of charity is not at all flattering to the independent spirit of the average American. It is our belief, therefore, that the employer should confine himself to meeting his legal obligations and doing such additional things as seem to be based on sound business principles.

If we accept the organization of a medical department as a part of the business and not a charity, there again comes up for decision the question as to which of two paths should be followed: Should the medical department undertake to do all the work possible alone, or should it be undertaken as a cooperative effort between the industrial medical department and the physician in private practice? It is undoubtedly possible to conduct along ethical lines a medical department that is wholly independent of the physician in private practice; but, after much giving and taking on both sides, experience has led us to believe that cooperative effort with the physician in private practice promises the best returns for the patient.

PLAN OF OPERATION

Our development has brought us to this plan of operation:

The medical department is maintained in industry in a way wholly independent of the company.

The medical records are the property of the physicians in industry and not of any lay person in the plant, from the president of the company down.

The relation is strictly that of physician and patient—never that of employer and employee. No information concerning a patient coming into the medical office is ever given out, except under exactly the same conditions as it would be given out by a private physician. This we believe to be essential to the maintenance of a high standard of professional practice.

As provided by law, all the compensation conditions are taken care of, even if this requires following the patient into the home or to the hospital, in which case some member of the industrial staff or its consultants handles the case.

If, in a compensation case, the patient elects a physician other than a member of the industrial staff, it is aimed to have all the facilities of the industrial staff placed at the disposal of the man who has been chosen by the employee.

Cases that do not come under the compensation law are handled only when the patients can come to the general diagnostic clinic that is maintained. By this means it is hoped to keep ambulatory patients at work if this is possible and to the patients' interest. Records of the clinic show that four fifths of these ambulatory patients visiting the clinic continue at work while being treated.

Any physician caring for an employee may send such a patient to the dispensary for roentgen-ray or laboratory examination, etc., and the report, together with the patient, returned to the physician who sent the case. This is one of the chief points requiring the existence of confidence between the physician in industry and the physician in private practice. While it would be dangerous for the physician in industry to lose his pride in holding a case, yet it would be still more dangerous for him to fail to use every effort to return a patient sent to him in consultation.

At this point we should like to emphasize the necessity of following the ethics of the profession more strictly in industrial practice than in any other type of work. In the long run this will advance the industrial physician much farther and, still more important, will advance the interests of his patients as a whole.

District nursing is undertaken by nurses in the employ of the company, but it is essential that in making visits the nurses be impartial in their recommendation of physicians. They should be instructed to ascertain conscientiously who the family physician is, and then recommend that he be called. After the physician has been called they must then be as loyal in carrying out his instructions for him as if they were privately engaged by that physician.

The opportunity for complications for the physician in industry and in private practice is probably greater through a nursing force than in any other way. If the physician in industry is capable and has a good personality, he naturally has an opportunity of convincing his nurses that his methods are superior. He fails entirely to do his duty, however, if he does not impress on them that no matter what regard they

* Read before the Hartford County Medical Association, South Manchester, Conn., Oct. 26, 1920.

may have for him as an individual, their allegiance belongs to the family practitioner during the time he is in charge of the case.

The industry wants the employee cured in the shortest possible time. The employee wants to be cured in the shortest possible time. And it is to the interest of the private practitioner to restore his patient to industry in the shortest possible time. These three contracting parties therefore have a common interest and, if a private practitioner undertakes a piece of this work, it is to industry's best interests to put at the disposal of the private practitioner all of the facilities that are placed in the hands of its industrial physician.

It is short-sighted policy for industry to try to develop a group of physicians in its own employ at the expense of the private practitioner's development. It is, indeed, difficult to state just how far industry should go in the development of a medical department; but it seems as if it should be kept in mind that a medical department on a business basis should not ordinarily advance beyond the point necessary for meeting obligations imposed by law, for keeping the workman on the job, and getting the patient's confidence necessary properly to supervise and study health conditions.

We would not have it understood that these things can be accomplished without a hitch—without misunderstandings—or that things do not happen which need straightening out. The patient is not always a reliable source of information regarding the other physician's attitude. But the earnest desire to live up to those principles and the confidence existing between the two groups make it possible to carry out such a plan.

CONCLUSION

The industrial member of the committee presenting this paper wishes to state publicly that it is the fair minded attitude of the private practitioner and his willingness to meet the industrial man on an ethical basis that is responsible for whatever contribution has been made toward working out the proper relations.

Miscellany

ISOHEMAGGLUTINATION

Recommendation That the Jansky Classification Be Adopted for Universal Use *

The following report and recommendation in regard to the grouping of persons on the basis of isohemagglutination has been agreed on unanimously by special committees appointed to consider the matter, Ludvig Hektoen, W. J. Elsner and Reuben Ottenberg representing the American Association of Immunologists, C. G. Bull, J. A. Kolmer and A. F. Coca the Society of American Bacteriologists, and H. T. Karsner the Association of Pathologists and Bacteriologists.

HISTORICAL

In 1901, Landsteiner (*Wien. klin. Wchnschr.* **14**:1132, 1901) found that twenty-two persons studied by him could be divided into three groups with respect to isohemagglutination: Group A, the serum of which agglutinated the corpuscles of Group B but not those of Group C, the corpuscles of Group A being agglutinated by the serum of Groups B and C.

Group B, the serum of which agglutinated the corpuscles of Group A, but not those of Group C, the corpuscles of Group B being agglutinated by the serum of Groups A and C.

Group C, the serum of which agglutinated the corpuscles of Groups A and B, the corpuscles of the group not being agglutinated by the serum of any of the individuals examined.

There was no reaction between the serum and corpuscles of different members of the same group.

A little later, Decastello and Sturli (*München. med. Wchnschr.* **49**:1090, 1902) described a fourth group, the serum of which did not agglutinate any corpuscles the corpuscles of the group being agglutinated by the serum of all Landsteiner's groups, but not by the serum of their own group.

In 1907, Jansky (*Sborn. klin.* **8**:85, 1907) described the following four groups:

Group 1, the serum of which agglutinates the corpuscles of Groups 2, 3 and 4, while the cells are not agglutinated by any serum.

Group 2, the serum of which agglutinates the corpuscles of Groups 3 and 4, but not those of Groups 1 and 2, while the corpuscles are agglutinated by the serum of Groups 1 and 3, but not by those of Groups 2 and 4.

Group 3, the serum of which agglutinates the cells of Groups 2 and 4, but not those of Groups 1 and 3, while the corpuscles are agglutinated by the serum of Groups 1 and 2, but not by those of Groups 3 and 4.

Group 4, the serum of which does not agglutinate any corpuscles, while the corpuscles are agglutinated by the serum of all other groups.

In 1910, Moss (*Bull. Johns Hopkins Hosp.* **21**:63, 1910) made the following classification:

Group 1, the serum of which does not agglutinate any corpuscles, while the corpuscles are agglutinated by the serum of Groups 2, 3 and 4.

Group 3, the serum of which agglutinates the corpuscles of Groups 1 and 3, while the corpuscles are agglutinated by the serum of Groups 3 and 4.

Group 3, the serum of which agglutinates the corpuscles of Groups 1 and 2, while the corpuscles are agglutinated by the serum of Groups 2 and 4.

Group 4, the serum of which agglutinates the corpuscles of Groups 1, 2 and 3 while the corpuscles are not agglutinated by any serum.

At the present time it is accepted that the four groups considered include all adult persons; i. e., that the classification is complete.

Landsteiner found only three groups, but with the addition of the groups described by Decastello and Sturli, one can readily construct the groups described by Jansky. Landsteiner's Group C corresponds to Jansky's Group 1; Group A, to Group 2; Group B, to Group 3, and the group described by Decastello and Sturli corresponds to Jansky's Group 4. The same applies to Moss' classification, with the exception that the Decastello-Sturli group becomes Moss' Group 1, and Landsteiner's Group C, Moss' Group 4. It is seen, therefore, that the classifications of Jansky and Moss are identical excepting that Groups 1 and 4 are interchanged.

CONFUSION AND POSSIBLE ACCIDENTS FROM PRESENT USAGE OF TWO CLASSIFICATIONS

Both the Jansky and Moss classifications appear in textbooks and manuals. Some authors discuss both classifications, prominence being given to the classification that presumably the author himself uses in practice. Certain books give only one classification without mentioning the other.

In grouping persons for blood transfusion, both classifications are used, the classification of Moss being the more common, especially in France, England and the United States.

The use of different classifications in manuals and textbooks has caused confusion and misunderstanding in teaching.

It is also possible for serious accidents to arise in connection with transfusion of blood through confusion of the two classifications. This is especially true in case prospective donors are grouped by different examiners or at different hospitals. During the war, many individuals were tested and informed that they belonged to a certain group. Should such an individual be transfused or used as a donor without further tests and the other recipient or donor, as the case might be, be grouped according to a different classification, serious results might arise.

RECOMMENDATION

As further confusion and the possibility of accident may be avoided by the universal use of one classification, it is recommended unanimously on the basis of priority that the Jansky classification be adopted.

* Reprints of this article will be sent by THE JOURNAL on receipt of 4 cents in postage.

Book Notices

THE PHYSIOLOGY OF MUSCULAR EXERCISE. By F. A. Bainbridge, M.A., M.D., D.Sc., Professor of Physiology, University of London. Cloth. Price, $3.75 net. Pp. 214, with 22 diagrams. New York: Longmans, Green and Co., 1919.

This is the fourth in the series of monographs on physiology issued under the editorship of Professor Starling. The book combines direct and simple diction with scientific accuracy and lucid reasoning, thus making it useful not only to the specialist and the general medical practitioner, but also to the educated layman. The first seven chapters review the physiologic changes induced by exercise in the muscle and the nervous tissue, the blood, and the vascular and the respiratory mechanisms. The last five chapters deal with the applied physiology of training, second wind, exercise at high altitudes, fatigue (individual and industrial), the effort syndrome, overstress of the heart, and beneficial effects of exercise. Each chapter closes with an admirable summary of the important conclusions reached in the development of the subject under consideration. The author states in the preface that "the fullest cooperation between the laboratory worker and the physician is of supreme importance for bringing about a clearer understanding and more effective practical application of the principles underlying the behavior of the body during muscular exercise, since on a knowledge of these principles depends success or failure in the treatment of the unfit and in the building up of the sound man. I have attempted to present my subject in such a way as to promote a closer connection between the investigator in the laboratory and those directly concerned with the health and well-being of the community." The body of the monograph demonstrates the success of the author in carrying out this practical aim. The book closes with reference to the more important publications in the field. The author concludes the discussion of cardiac overstrain with this statement: "There is no evidence that, in a perfectly healthy man, even the most intense exertion produces any harmful effect on the heart." This would be reassuring were it not for the fact that present diagnostic methods fail to reveal the slight myocardial weaknesses, and the further fact that the "constant drop of water" experiment, freed from factors other than the excessive physical work, has not yet been made.

WITH THE DOUGHBOY IN FRANCE. A Few Chapters of an American Effort. By Edward Hungerford. Cloth. Price, $2. Pp. 291, with illustrations. New York: The Macmillan Company, 1920.

THE STORY OF THE AMERICAN RED CROSS IN ITALY. By Charles M. Bakewell. Cloth. Price, $2. Pp. 253, with illustrations. New York: The Macmillan Company, 1920.

THE PASSING LEGIONS. How the American Red Cross Met the American Army in Great Britain, the Gateway to France. By George Buchanan Fife. Cloth. Price, $2. Pp. 369, with illustrations. New York: The Macmillan Company, 1920.

These three volumes, issued in uniform binding and style, recite the exploits of the American Red Cross, respectively, in France, Italy and England during the great war. They do not present the usual stereotyped history of military or social effort. Rather they sketch in broad lines a picture of what the Red Cross tried to do in making easier the lives of soldiers and civilians. Hungerford's book deals with France; it describes preliminary surveys, the setting up of Red Cross canteens, the gradual movement toward the front, the casualties of the service, the Red Cross work in the hospitals, and the trip home. It is enlivened by actual incidents of humorous or tragic nature. Bakewell's book is devoted to the work of the Red Cross in Italy. The story is told in an impersonal manner. Here again the Red Cross followed the fighting forces and administered aid to the impoverished civilians. The coming of the American troops called for special service, and the final great battle with the Austrians involved aid to the Central Empires as well as to the Allies. This volume contains an appendix listing the entire personnel of the service and giving a budget. The "Passing Legions" describes how the American Red Cross took care of the American Army in Great Britain. The work was entirely back of the lines, involving, however, care of the wounded in British hospitals, and the first welcome to American troops on the way to the front. To all interested in the Red Cross and social efforts for the troops, these books will be of interest; they form a pleasing history of a great work.

PUBLIC HEALTH LABORATORY WORK (CHEMISTRY). By Henry R. Kenwood, C.M.G., M.B., F.R.S., Chadwick Professor of Hygiene and Public Health, University of London. Seventh edition. Cloth. Price, $4. Pp. 420, with illustrations. New York: Paul B. Hoeber, 1920.

This is in the seventh edition of this valuable reference work on the control of water, sewage, air and food. Of particular interest are the chapters on food examination which deal largely with sophistication and adulteration of food products.

Medicolegal

Care Required of an Injured Person

(West Lumber Co. v. Keen (Texas), 221 S. W. R. 625)

The Court of Civil Appeals of Texas, in affirming a judgment in favor of plaintiff Keen for $5,000 damages for personal injuries consisting of having one of his legs broken just above the ankle, a dislocation or mashing of the ankle, and minor bruises, holds that it was not error to refuse to require the jury to find whether, if the plaintiff had obeyed the directions, if any, of the physician who treated him, his injury would have been permanent, or not. The court says that, as it understands the rule, a person injured by the negligence of another is required only to use such care and prudence in treating and taking care of himself after the injury as would have been used by an ordinarily careful and prudent person in treating such injuries under the same or similar circumstances; but such injured person is not bound, as a matter of law, to obey the instructions and advice of any particular physician by whom he may be treated, or to apply any specific treatment prescribed by such a physician. Where such an issue is raised by proper pleading and evidence in line therewith, the proper inquiry would be: Did the plaintiff exercise such care and prudence in taking care of himself and in having his injuries treated as would have been exercised by an ordinarily careful and prudent person under the same or similar circumstances?

Privilege May Be Waived by Heirs

(Flack et al. v. Brewster (Kan.), 190 Pac. R. 616)

The Supreme Court of Kansas, in affirming a judgment which set aside a deed to real estate for want of mental capacity in the grantor to execute the deed, says that the principal question on the appeal concerned the admissibility of the testimony of two physicians who attended the grantor in her last illness. The Kansas statute provides that a physician or surgeon shall be incompetent to testify concerning any communication made to him by his patient with reference to any ailment, or concerning any knowledge obtained by a personal examination of the patient, without the consent of the patient. A more liberal view has been taken as to the matter of waiver in Kansas than in some states. For instance, it has been held that, as the statute provides that the patient himself may consent to the testimony of the physician, no question of public policy is involved. The prohibition imposed on the physician is the privilege of the patient and not of the physician; nor yet of the public, and therefore a patient may make a valid contract waiving the privilege afforded him in the statutory prohibition. Furthermore, while the privilege is personal to the patient and may be waived by him, the general rule is that after his death the privilege may be waived by his legal representatives and those interested in the preservation of his estate. Restrictions on the full development of the facts and the ascertainment of the truth of a controversy are strictly construed, and the privilege being personal in its nature, it should not be extended by implication, especially after the death of the one for whose benefit it was given. Of course, the prohibition of the statute must be given the effect intended by the legislature; but, so far as it is open to inter-

pretation, it should be strictly construed instead of reaching for an implication that would operate to suppress the true facts necessary to a just determination of the issue involved. Wherefore the court holds that, in an action by heirs of a deceased grantor, contesting the validity of a deed executed by the grantor to her sister shortly before her death, on the ground of the unsoundness of her mind at the time of the execution, the testimony of a physician who attended her in her last illness as to the knowledge gained by him in his professional capacity, relating to her mental condition, may be admitted in evidence, where the heirs have waived the statutory privilege, which was effectually done in this case by the plaintiffs, who were suing as heirs of the deceased grantor, offering the evidence, they being interested in preserving the estate of the deceased, which would have been largely diminished if effect had been given to the deed held invalid. But as the defendant in this action, although a sister of the deceased grantor, claimed no rights as heir or devisee, but defended solely on the basis of being the grantee in the deed, she was not entitled to assert the statutory privilege, or to object to the testimony of the physicians in regard to the competency of the grantor.

Society Proceedings

SOUTHERN SURGICAL ASSOCIATION

Thirty-Third Annual Meeting, held at Hot Springs, Va., Dec. 14-16, 1920

The President, DR. WILLARD BARTLETT, St. Louis, in the Chair

Fractures of the Skull

DR. C. E. CALDWELL, Cincinnati: Skull injuries may be divided into two primary divisions, those in which the traumatism to the neural centers is of such severity that the patient is obviously doomed and dies within a few hours after the receipt of the injury, and those in which the injury is of such a nature as to permit of the patient's living to present those problems of intervention or nonintervention which are to determine the ultimate results of treatment. Of forty-one patients seen by me, seven were subjected to operation. Five of these patients recovered. Of the thirty-four patients not operated on, twenty-four recovered. Of the ten who died, eight died within two or three hours after admission. The remaining two lived four and five hours, respectively, and would have been operated on had I seen them earlier. The two who died after operation had severe intradural hemorrhage.

Late Results of a Series of Head Injuries

DR. C. C. COLEMAN, Richmond, Va.: The incidence or severity of the late results of head injuries cannot be predicted on the type or degree of an acute injury. The prevention of late effects of head injuries is closely linked with early treatment and after-care.

DISCUSSION

DR. ROBERT T. MORRIS, New York: Intracranial pressure, which is relieved by decompression, is frequently due to an irritative lesion which is caused by contraction of dural adhesions. These adhesions often are the cause of epileptic and epileptoid seizures and various psychoses coming on as late symptoms. When the dural adhesions cover only a small area we sometimes have a marked demonstration from the relief of pressure. When secondary changes have taken place, if the parenchyma has been injured seriously, with fatty changes in the cortex, and the cells of Purkinje destroyed, good results will not accrue from the separation of dural adhesions alone. When it is merely a matter of an irritative lesion of limited area, decompression is not the operation—separation of dural adhesions is indicated, and the application of methods for the prevention of their recurrence.

DR. HENRY O. MARCY, Boston: Hunter McGuire related the case of a man who was struck on the head with a missile in one of the southern battles. He was brought into Richmond unconscious. He made a slow recovery. He lost the ability to speak, and he lost the power of reasoning and thinking, and lived an animal life for thirteen years. Dr. McGuire operated on him, and on waking from the anesthetic the man exclaimed, "Where has the army moved today?"

DR. W. P. CARR, Washington, D. C.: I wish to confirm what Dr. Morris has said about separating dural adhesions. I have observed great improvement by separating dural adhesions with my finger in some cases, while in others I have found them so tough or dense that they had to be cut with a knife or scissors. Decompression, a necessary part of the operation, has a good deal to do with recovery of these patients, because in most of them we find an edematous condition of the brain, and a great deal of that fluid will drain off during the operation.

DR. JAMES E. THOMPSON, Galveston, Texas: In the severe cases no one would interfere, except by spinal puncture. Symptoms can be warded off by spinal puncture, which relieves pressure. Our main difficulty is in understanding what is the condition of the brain after injury.

DR. J. W. HENSON, Richmond, Va.: Dr. Morris, how would you locate dural lesions?

DR. ROBERT T. MORRIS, New York: Almost always there is local tenderness on pressure, and the scalp is tender over that point.

SYMPOSIUM ON CANCER

Cancer Infection

DR. A. J. OCHSNER, Chicago: Cancer develops very constantly on the proximal side of the pylorus and on the distal side of the ileocecal valve, while it develops only rarely between these two points. The fields in which it will develop contain substances that are acid in reaction, while the intestinal contents in the intervening portion are alkaline. Every precaution should be taken against cancer infection, notwithstanding the fact that its infectiousness has not been proved. Cancer occurs almost exclusively in portions of the body exposed to the irritation of the outside world. This includes the gastro-intestinal canal, which comes in contact constantly with filthy food in locations in which stasis insures long continued contact and persistent irritation. We find a notable example in the enormous incidence of cancer of the stomach in people eating raw vegetables growing in soil fertilized with manure. The Japanese, who eat such vegetables in abundance, suffer greatly from cancer of the stomach. The inhabitants of India, whose religion commands them to boil food and drink, are notably free from stomach cancer. Sewerage is said to be an important factor in the production of cancer.

Cancer of Uterus

DR. JOHN B. DEAVER, Philadelphia: The cervix is the more common site of uterine carcinoma. In the vast majority of cases it develops in women who have had children. Complete hysterectomy is probably as sure a means of curing the disease as we have, provided the growth is not so far advanced as to threaten adjacent tissues. It is these cases also that the radiologist believes are most amenable to his treatment. This may be so, but it has not been my experience.

Radium in Carcinoma of Uterus

DR. WILLIAM KOHLMANN, New Orleans: In many instances radium may be compared favorably in its effects with the results obtained by surgical measures; and frequently in cases in which surgery fails, it will bring about relief and even apparent cure. Of ninety-six cases of carcinoma of the uterus which have come under my observation, fifty-six were treated with radium only. The clinical diagnosis of carcinoma was confirmed microscopically. With few exceptions, all the patients were benefited. Some patients improved to such an extent that a cure could be hoped for.

Cancer of Rectum and Large Intestine

DR. GEORGE W. CRILE, Cleveland: From one to two days before the operation, large quantities of water are given by mouth, by rectum, subcutaneously or by means of a Rehfuss tube. If necessary, a transfusion of blood is given before the operation, and, if required, also after the operation. If the myocardium is impaired, digitalis is given until the action of

the heart is improved sufficiently for the safe performance of the operation. The operation is performed in two stages, a sufficient period after the preliminary colostomy being allowed to insure the reaccumulation of the reserves of the patient. The operation is performed under nitrous oxid-oxygen analgesia, plus local anesthesia. A wide incision is made to insure the minimum handling of tissue. After operation, hot packs are applied to the abdomen in order to increase the functional activity of the liver. In cases of cancer of the rectum, radium is employed both before and after the operation. In cases of cancer of the large intestine, radium is applied after the operation. If these procedures are carried out in detail, the patient leaves the operating room in approximately the same condition as he entered it, and his convalescence is well secured.

Cancer of Pelvis of Kidney

DR. ALEXIUS MCGLANNAN, Baltimore: No definite relation can be found between the development of the papillary tumors and the presence of stone in the kidney. That leukoplakia may be the result of calculus irritation and, in turn, be the source of a squamous cell tumor is a possibility. Nephrectomy is required for the removal of these tumors. The ureter should be investigated carefully, and as much of this organ as is indicated should be removed because of the danger of an implanted growth in its lumen. In many cases complete nephro-ureterectomy should be performed. Some authorities believe that the latter should be the operation of choice in all cases. The symptoms of papilloma of the renal pelvis are fairly typical. Hematuria is almost constant, and the quantity of blood lost may be sufficient to disable the patient. There is some blood in the urine almost all the time, and at intervals profuse hemorrhage occurs and may persist for days or weeks. The profuse bleeding is usually preceded by a colicky pain, and this intermittent hematonephrosis is considered a characteristic symptom. The presence of transitional epithelium in the urine is a valuable corroborative symptom.

Life Expectancy Following Radical Amputation for Cancer of Breast

DRS. W. E. SISTRUNK and W. C. MACCARTY, Rochester, Minn.: Age seems to have a definite bearing on the results to be expected following operations. Of 218 cases, 41.7 per cent. of the patients over 50 years of age are alive from five to eight years after operation, while only 31.8 per cent. of those under 50 have lived for a corresponding time. The immediate hospital mortality from operation for cancer of the breast was less than 0.5 per cent. The prognosis has not been affected by the complete removal of small growths for microscopic diagnosis before the radical operation is performed. When local recurrences were found following operation, metastases were demonstrated in other regions in 60.9 per cent of the cases. In our experience nearly all patients who develop a recurrence of the malignancy following operation die from the disease.

Diagnosis of Breast Lesions at Exploratory Incision

DR. JOSEPH C. BLOODGOOD, Baltimore: The propaganda of education on cancer has had its effect. Women conscious of trouble in a breast now seek advice quickly. My records show a rapidly increasing number of patients who, after examination, have apparently no discoverable local condition in which experience teaches that operation is necessary. The percentage of benign lesions has rapidly increased. The number of cancers of the breast in the early stage is largely increased. In the majority of these cases, the diagnosis can be made only at the exploratory incision, and the best permanent results are obtained by the immediate complete operation after the exploratory incision has revealed the cancer. The mistake that should not be made is the incomplete operation for cancer. The records of the Surgical Pathology Laboratory of the Johns Hopkins Hospital show that since 1889, a period of thirty-one years, the mistake of performing an incomplete operation for cancer of the breast has been made five times by Dr. Halsted and the surgeons operating or trained in his clinic, and this mistake has been made but once since 1900. When cancer of the breast is incompletely removed, there is rapid local recurrence, with the rarest exceptions within one year. When only the breast is removed for cancer, there may be a longer period before the involved axillary glands become palpable. In the vast majority of lesions of the breast, the gross inspection of the local lesion is as important as the examination of the frozen section, and in many, especially in certain benign lesions, a more reliable conclusion can be reached. When cancer is distinct on gross inspection it is equally distinct in the section; but many tumors, especially the encapsulated benign adenoma and many of the cysts, have on gross inspection almost pathognomonic signs of benignancy, while frozen sections reveal pictures difficult to distinguish from possible early malignancy. This conclusion has been confirmed by submitting many sections to a large number of pathologists.

DISCUSSION

DR. W. C. MACCARTY, Rochester, Minn.: The surgeon is the only man who can show us cells as they really are, and he is the only man who is doing it. As to the early diagnosis of cancer, if clinicians would educate people to come to us in what we consider the precancerous stage, we must be able to differentiate a precancerous condition from one that is not precancerous. In our laboratory, 20 per cent. of all the tumors of the breast must of necessity be diagnosed by the microscope, which means that only 80 per cent. can be possibly diagnosed grossly, and 80 per cent. of these figures is the percentage of gross diagnostic efficiency in the hands of persons who have done nothing else for the last fifteen years but examine pathologic material. If the surgeon who only occasionally sees these cases possesses that diagnostic efficiency, I shall be greatly surprised. We study every breast in which there is the slightest suspicion. What does that mean? We are picking up grossly smaller carcinomas than we ever picked up before.

DR. J. SHELTON HORSLEY, Richmond, Va.: If cancer is chiefly caused by the contact of manure with tissue, as pointed out by Dr. Ochsner, it would be difficult to explain why cancer in the rectum, which is in constant contact with autogenous manure, is not universally fatal. It is also difficult to explain why it is that cancer of the stomach appears to be much more common than cancer of the rectum. The contents of the stomach under normal conditions are practically sterile. If we include the general types of cancer or malignant tumors, it would be difficult to explain why sarcoma of bone is not due to tissue contact with manure. It is also true that carcinoma of the breast occurs in a locality that is far more protected than the face. It is also true, as statistics show, that cancer of the buccal surfaces in the Indian is much more common even without the use of the pipe. Cancer following the chewing of the betel nut or smoking a pipe is a comparatively sterile condition.

DR. CHARLES H. MAYO, Rochester, Minn.: If we educate our communities in regard to certain things, people will not only ask for them, but demand them. Much of the work that has been done to advance medicine in the past has been accomplished by educating the people. We have increased wonderfully in our ability to control cancer because we have educated the people to come early.

DR. JOHN G. CLARK, Philadelphia: Although I have seen cases that have led me to favor the use of radium, I take the position that if a case is still operable, I will operate; but we are finding fewer and few inoperable cases.

DR. R. C. COFFEY, Portland, Ore.: With regard to the transportation of cancer cells during operation, within the last month I have had four cancer growths in abdominal wounds which I made within the last year in cases in which the growth has not recurred at the point from which the cancer was removed.

DR. THOMAS S. CULLEN, Baltimore: The medical profession should support the excellent work of the American Society for the Control of Cancer.

DR. WILLIAM B. COLEY, New York: I agree with Dr. Mayo that many of these tumors seemingly benign are potentially malignant. Fifty per cent. of sarcomas have an antecedent local trauma. A large number of cases of bone tuberculosis start with antecedent trauma.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Archives of Internal Medicine, Chicago

Dec. 15, 1920, 26, No. 6

*Use of a High Fat Diet in Treatment of Diabetes Mellitus. L. H. Newburgh and P. L. Marsh, Ann Arbor, Mich.—p. 647.
*Metabolism in Tuberculosis. W. S. McCann and D. P. Barr, New York.—p. 663.
*Failure of Antibody Formation in Leukemia. K. M. Howell, Chicago. —p. 706.
*Primary Mesothelioma of Pleura. E. S. Du Bray and F. B. Rosson, San Francisco.—p. 715.
*Fat Metabolism in Diabetes Mellitus. N. F. Blau and S. T. Nicholson, Clifton Springs, N. Y.—p. 738.
*Variations in Normal Blood Sugar. S. Strouse, Chicago.—p. 751.
*Alimentary Hyperglycemia. S. Strouse, Chicago.—p. 759.
*Renal Glycosuria. S. Strouse, Chicago.—p. 768.

High Fat Diet in Diabetes.—Newburgh and Marsh state that patients with severe diabetes, as a class, do not remain sugar free on the usual high protein diet unless the total energy intake is kept so low that incapacity from starvation results. The only satisfactory diet is one which will keep the diabetic sugar free, which will prevent the occurrence of serious acidosis, which will maintain nitrogen balance and which will make it possible for him to resume the ordinary activities of life. With these four points in mind, they studied the effect of a high fat, low protein, low carbohydrate diet in the treatment of diabetes. Then experience with this type of diet in the management of seventy-three diabetics has convinced them that it is capable of fulfilling these four specifications. Diet lists are given.

Metabolism in Tuberculosis.—McCann and Barr found that the basal metabolism of tuberculous patients may be normal or very slightly above that of normal men of the same size. Thus, in ten cases, the variation from average normal was from minus 3 to plus 15 per cent. Further increases in metabolism occur with a rise of body temperature. These increases are not large. Thus one case was given in which the temperature rose 1 degree C. during two hours without a chill. The heat production of the second hour was only two calories greater than that of the first hour. Within a rectal temperature of 104 F. (40 C.) the metabolism may be 30 per cent. above the average normal. The basal heat production in tuberculosis may be less than the normal for the same patient when in health; in other words, the loss in weight may be accompanied by a reduction in metabolism which more than compensates for the tendency to increase caused by the disease. Limited data regarding the nitrogen excretion show that, while a toxic destruction of protein does exist in tuberculosis, it is not large. The urinary nitrogen may be reduced to from 5 to 6 gm. per diem, though nitrogen balance may be attained only at a higher level (about 10 gm. a day). The specific dynamic rise in metabolism produced in two cases by the ingestion of a protein meal corresponded closely with that produced by the same meal in three normal men. In view of the fact that the food requirements of tuberculous patients are not large, either as regards total energy value or nitrogen content, McCann and Barr consider that forced feeding is unnecessary and is probably harmful in the active stages of pulmonary disease. Since protein increases the respiratory exchange in the tuberculous as in normals it may be well to limit the protein intake during periods of activity (of the disease) in order to put the lungs at rest.

Failure of Antibody Formation in Leukemia.—The failure of both opsonin and agglutinin formation after typhoid vaccination, as shown in the two cases reported by Howell, of agglutinin formation in Moreschi's spontaneously infected cases and in his vaccinated cases, and of agglutinin production after vaccination with still another bacterial species, as shown by Rotky, may indicate that the tissues of the leukemic individual have lost the property of antibody formation in general. The loss of ability to form antibodies is probably the result of the marked alterations in the hematopoietic tissues which characterize leukemia. This loss of ability may be due to the excessive proliferation of the hematopoietic tissues, one of whose normal functions is the formation of antibodies. With rapidly repeated cell generations the cellular energy used in multiplication prevents the utilization of the energy which is necessary for normal function.

Primary Mesothelioma of Pleura.—A clinical and pathologic contribution to pleural malignancy is made by Du Bray and Rosson and one case is reported in which the clinical diagnosis of malignant pleural disease was substantiated by the necropsy findings. The two most important and at the same time difficult diseases to exclude in the differential diagnosis are pulmonary tuberculosis with hemorrhagic pleural effusion and primary malignant disease of the lung or bronchus.

Fat Metabolism in Diabetes.—Twenty-six cases of diabetes were compared by Blau and Nicholson in relation of the blood fat to the blood sugar and were found to fall roughly into three groups, the members of each group bearing certain clinical resemblances to each other. About 42 per cent. of these cases showed, at the beginning of treatment, a marked increase of blood lipoids, along with a considerable drop of the blood sugar due to starvation or a severely destricted diet. This rise in the lipoid curve must not be taken as a measure of the degree of impairment of the fat burning mechanism; it may be due to a normal response to fasting and also to an insufficient carbohydrate intake. Clinically these were all severe cases of diabetes. Blood fats seemed to rise and fall with the blood sugar in almost 27 per cent. of the cases, decrease in the fat apparently progressing more slowly than the decrease in the blood sugar. All but two of these patients were in a milder stage of the disease. In about 31 per cent. of the cases there was an almost constant value for blood lipoids, at high level, while the blood sugar decreased. They all presented a history of infection previous to the onset of diabetes, and suffered from a somewhat more severe form of the disease than those of the preceding group. The lipoid value seemed to be lowest in a negative carbohydrate balance, showing that the diabetic organism can utilize fats more readily in the presence of large amounts of sugar in the body, and that in "sugar free" patients there must be a great strain on the fat burning mechanism when large amounts of fats are fed. Evidence of this may often be seen in the high values for plasma cholesterol.

Variations in Normal Blood Sugar.—Efforts made by Strouse to change blood sugar percentage of five normal persons by increased or diminished water intake and excretion failed to change the blood sugar percentage. This indicates that for practical clinical purposes the blood sugar percentage method is accurate. Daily variations of blood sugar percentage occurred in five normal persons. These variations seem to depend on changes in the weather.

Alimentary Hyperglycemia.—A review of his own work on diabetic curves for the past few years has shown Strouse that there is a definitely normal and definitely pathologic type of reaction, but that between these two extremes the reaction may waver either way. The investigation here reported concerns mainly the interpretation of the wavering type of reaction, its relationship to clinical diagnosis, and its value in the study of the metabolic change in diabetes.

Renal Glycosuria.—Four cases of renal glycosuria are presented by Strouse. Two patients have been under observation two years, one patient almost five years, and one patient for eight years. All four still show glycosuria. None shows symptoms of diabetes mellitus. In one, tests for renal function seven years after onset showed no depression of renal function except in regard to phthalein excretion. The two who have been observed the longest show at the end of four and eight years, respectively, a ultilization of glucose that cannot be considered strictly normal, one at the end of seven years' observation showing a distinctly pathologic alimentary hyperglycemia. This may indicate the beginning of metabolic disturbance. This study emphasizes the importance of long and continued observation of all patients with this most interesting anomaly.

Archives of Neurology and Psychiatry, Chicago

December, 1920, **4**, No. 6

Special Field of Neurologic Surgery After Another Interval. H. Cushing, Boston.—p. 603.
*Abdominal Neurasthenia. A. S. Taylor, New York.—p. 638.
*Case of Cerebral Porosis: Histopathologic Report. G. B. Hassin, Chicago.—p. 645.
*Support in Facial Nerve Paralysis. N. S. Yawger, Philadelphia.—p. 659.
*Tinel's Sign, Formication or Distal Tingling on Percussion and Deep Pressure Sensation. J. O. Bower and I. L. Hawkins, Wyncote, Pa.—p. 662.
Nervous Signs and Symptoms as Related to Certain Causations of Conduct Disorder. W. Healy, Boston.—p. 680.

Abdominal Neurasthenia.—Four cases are analyzed by Taylor selected from a larger series, to illustrate varying phases of the problem. One patient had had a prolonged history of abdominal pain and digestive disturbance, on which the neurasthenic condition had been engrafted and finally became the predominating feature in the minds of many of the consultants. The second patient who had had little digestive disturbance beyond flatulence and that without constipation, suddenly developed a neurasthenia, apparently idiopathic, which was greatly increased by influenza. For a year he had had various treatments without result. The third patient also had few symptoms relating to the digestive tract, except flatulence and occasional constipation. Her neurasthenia came on gradually during several years, was associated with lack of mental balance and probably with disturbance of the endocrine system. The fourth patient had never been robust and developed a profound neurasthenic condition following a simple herniotomy. In her case the neurasthenic and abdominal symptoms developed simultaneously and were about equally prominent over a period of eight years. A painstaking examination of the digestive apparatus indicated what proved to be, in these cases, the chief underlying cause of the illness. The nerve exhaustion was apparently secondary to the absorption of toxins from the digestive canal, and it is Taylor's belief that the formation of these toxins largely resulted from mechanical interference with the normal motility of the digestive canal. The obvious deduction from the facts presented is that a complete examination should be made of the digestive tract of every neurasthenic. In a certain proportion of cases surgery would offer a short cut to recovery.

Cerebral Porosis.—The most striking pathologic features in Hassin's case are the cavities, the bacillar venous thrombosis and the subarachnoid changes. The most striking clinical phenomena are the bronze skin and mental dulness. Both clinical and pathologic findings are most probably a manifestation of the gas bacillus infection, of which the cavities are the most outstanding pathologic features.

Support in Facial Nerve Paralysis.—By means of adhesive plaster strips Yawger supports the sagging tissues for the time being.

Tinel's Sign.—Bower and Hawkins state that there is a definite relation between the return of deep sensation and the advance of formication. When deep sensation returns normally there is an advance in formication of one-tenth inch daily.

Archives of Ophthalmology, New York

November, 1920, **49**, No. 6

Detachment of Retina. D. T. Vail, Cincinnati.—p. 553.
Trephining and Aspiration in Retinal Detachment. E. S. Thomson, New York.—p. 563.
Intranasal Dacryocystostomy. C. F. Bookwalter, Chicago.—p. 568.
Bilateral Glioma; Report of Case Unsuccessfully Treated with Radium. A. Knapp, New York.—p. 575.
Nasolacrimal Surgery in Ophthalmologic Perspective. C. B. Walker, Springfield, Mass.—p. 585.
Cyclopia, Its Bearing on Certain Problems of Teratogenesis and of Normal Embryology; Description of Cyclocephalic Monster. E. Hill, Richmond, Va.—p. 597.
Neuropathic Keratitis Setting in Long After Alcoholic Injections into Gasserian Ganglion for Relief of Trigeminal Neuralgia. B. Chance, Philadelphia.—p. 621.
Transient Herpetic Rash Over the Area of Distribution of the Ophthalmic Branch of the Fifth Nerve Following Application of Bluestone in a Case of Parinaud's Conjunctivitis. M. L. Foster, New Rochelle.—p. 628.

Illinois Medical Journal, Oak Park

December, 1920, **38**, No. 6

Human Breast: A Plea for Well-Directed Treatment Based on More Accurate Diagnosis. W. S. Bainbridge, New York.—p. 473.
Do Our Leaders Lead? If so, Whither? T. P. Foley, Chicago.—p. 479.
Accident Company, Doctor's Jinx. W. F. Grinstead, Cairo.—p. 481.
Caloric Method of Artificial Feeding in Normal Babies. L. O. Frech, White Hall.—p. 484.
Some Problems in Increased Intra-Ocular Tensions. T. Faith, Chicago.—p. 489.
Some Problems Encountered in Attempting to Apply Insurance Methods to Sickness Hazard. E. MacD. Stanton, Schenectady, N. Y.—p. 493.
*Volkman's Contracture of Forearm. C. U. Collins, Peoria.—p. 497.
Some Practical Phases of Local Anesthesia. J. R. Harger, Chicago.—p. 500.
Endocrine System. J. H. Hutton, Chicago.—p. 505.
Focal Infection in Head and Its Relation to Systemic Disease. C. F. Yerger, Chicago.—p. 509.
*Pulmonary Infection by Sporothrix of Schenk. F. Le Blanc, De Kalb.—p. 516.
*Case of "Argyria." C. E. Smith, De Kalb.—p. 517.
Significance of Cardiac Murmurs. C. J. McMullen, Chicago.—p. 517.
Sphenoid Sinuses. J. A. Cavanaugh, Chicago.—p. 521.
Abscess of Tongue. J. C. Dallenbach, Champaign.—p. 522.
Bronchopneumonia with Some Complications. G. W. Rice, Galena.—p. 525.
Saving of Foot Function by Skin Grafting. L. E. Barton, Malta.—p. 527.
Hernia of Bladder; Report of Two Cases. L. F. Watson, Chicago.—p. 527.
Technic for Removal of Foreign Bodies. W. M. Thompson, Chicago.—p. 531.
Some Complications in Cases of Acute Mastoiditis. J. S. Clark, Freeport.—p. 536.

Volkmann's Contracture.—Collins reports a case in which lengthening of tendons was resorted to with good results attending. He regards the procedure as much more simple than a resection of the bones of the forearm. The final result in his case shows no deformity, while a resection of the bones of the forearm would have left a shortened forearm. This patient was received into the service without question during the late war and served his required time in the army.

Sporotricosis of Lung.—Le Blanc cites two cases in which a diagnosis of pulmonary tuberculosis had been made, and he thinks not correctly, in which he saw in the throat a yellowish, firm, submucous granuloma, the size of a split pea. After endeavoring to puncture it and evacuate what might be pus, Le Blanc found that it was rather firm in texture. Microscopic examination disclosed a sporotrichosis granule bearing many spores which proved to be the sporothrix of Schenk.

Argyria.—Smith's patient took silver nitrate in ¼ grain doses, three times daily, for three months for a "catarrh of the nose" when it was noted that the skin of the face and hands—the exposed surfaces—was assuming a darker color. A focal infection in the maxillary sinus proved to be the cause of the catarrh.

Indiana State Medical Association Journal, Ft. Wayne

Dec. 15, 1920, **13**, No. 12

Silver Wire in Vesicovaginal Fistula. J. R. Eastman, Indianapolis.—p. 393.
Mediastinal Tumor. W. D. Asbury, Terre Haute.—p. 398.
Physician. F. B. Wynn, Indianapolis.—p. 400.

Journal of Bacteriology, Baltimore

November, 1920, **5**, No. 6

Bacterial Inhibition. I. Germicidal Action in Milk. W. H. Chambers, Urbana, Ill.—p. 527.
Bacterial Group in Decomposing Salmon. A. C. Hunter, Washington, D. C.—p. 543.
*Influence of Various Chemical and Physical Agencies on B. Botulinus and Its Spores. I. Resistance to Salt. Z. N. Wyant and R. Normington, East Lansing, Mich.—p. 553.
Time Saving Bacteriologic Apparatus. M. J. Prucha and F. W. Tanner, Urbana, Ill.—p. 559.
*Milk-Powder Agar for Determination of Bacteria in Milk. S. H. Ayers and C. S. Mudge, Washington, D. C.—p. 565.
*Use of Washed Agar in Culture Media. S. H. Ayers, C. S. Mudge and P. Rupp, Washington, D. C.—p. 589.

Inhibition of B. Botulinus by Salt.—The data obtained by Wyant and Normington prove quite conclusively that a large number of strains of *B. botulinus* are not inhibited by percentages of salt ranging from 1 to 10, when growing in

a medium of an alkalinity of 0.5. This may not signify that *B. botulinus* will survive 10 per cent. or less salt used in pickling, as the additional factor of acidity enters here, and this anaerobe is said to be injured—some strains quite decidedly so, by even a slightly acid medium (+0.5 to +0.8). However, the results obtained seem to indicate strongly that it is not the salt which is the inhibiting factor in the destruction of *B. botulinus* and its spores by pickling solutions.

Milk-Powder Agar for Determination of Bacteria in Milk.—Formulas for three agar mediums are given by Ayers and Mudge, two of these containing skimmed-milk powder with different amounts of peptone and meat extract. The third medium contains skimmed-milk powder and yeast extract, no peptone or meat extract being used. Any of the mediums described give counts very much higher than standard extract agar and the colonies are very much larger. The larger size of the colonies makes the counting process much more accurate. With these milk-powder mediums it is possible to obtain not only a total count, but a count of colonies of strong and weak acid-producing, alkali-forming, inert and peptonizing bacteria.

Washed Agar Culture Medium.—The standard extract medium with washed agar used by Ayers, Mudge and Rupp showed in many cases, when market milk was examined, a much higher count than the same medium with regular shred agar. Washing agar reduced its content of calcium and magnesium salts. A few experiments indicated that the removal of these salts was a factor in the cause of the higher counts. This point, however, is merely suggested by the results and not definitely proved. Since certain samples of milk show a higher count when plated on a washed-agar standard extract medium than on the regular standard extract medium, it seems evident that washing removes something detrimental to the growth of certain species of bacteria. This naturally suggests that a further study is needed of the value of washed agar in lines of bacteriologic work where it has not been used.

Journal of Experimental Medicine, Baltimore

Dec. 1, 1920, **32**, No. 6

*Biologic and Physical Properties of Hemotoxin of Streptococci. P. D. Meader and G. H. Robinson, Baltimore.—p. 639.

Divisions of So-Called Flexner Group of Dysentery Bacilli. W. C. Davison, Baltimore.—p. 651.

Biologic Study of Hemophilic Bacilli. E. C. Stillman and J. M. Bourn, New York.—p. 665.

Etiologic Rôle of Vibrio Fetus. T. Smith, R. B. Little and M. S. Taylor, Princeton, N. J.—p. 683.

*Production in Monkeys of an Acute Respiratory Disease Resembling Influenza by Inoculation with Bacillus Influenzae. F. G. Blake and R. L. Cecil, Washington, D. C.—p. 691.

*Pathology of Experimental Influenza and of Bacillus Influenzae Pneumonia in Monkeys. R. L. Cecil and F. G. Blake, Washington, D. C. —p. 719.

*Experimental Studies on Heteroplastic Bone Formation. G. Asami and W. Dock, St. Louis.—p. 745.

Simplified Production of Antimeningococcic Serum. H. L. Amoss, F. L. Gates and P. K. Olitsky, New York.—p. 767.

Hemotoxin of Streptococci.—The hemotoxin of the streptococcus, according to Meader and Robinson, is a labile substance affected by centrifugation or shaking. It is adsorbed by various organic and inorganic substances. Hemotoxin is produced within a wide range of hydrogen-ion concentrations. It is neither in nor on the bacterial cell but is free in the culture medium. It is probably not an enzyme. There are at least two substances which are essential to the medium for the elaboration of hemotoxin, one of which is phosphorus; the other is a substance of unknown composition. The unknown component is present in small quantities in unfiltered muscle infusion, but is more abundantly supplied by blood serum and kidney infusion. This substance is not an albumin, globulin, primary or secondary proteose, metaprotein, or peptone of the medium or enriching fluid. It is ether-soluble, is destroyed by boiling in alkaline solution and by prolonged heating, and is removed to a considerable extent by passage through a diatomaceous filter.

Experimental Influenza Inoculation.—By inoculation with *Bacillus influenzae* Blake and Cecil were able to initiate in normal monkeys an acute infection of the upper respiratory tract which may be complicated by acute sinusitis, tracheobronchitis, hemorrhagic edema of the lungs, bronchiolitis, and bronchopneumonia. This disease appears to be essentially identical with influenza with respect to its clinical course, symptoms, and complications. The etiologic relation of *B. influenzae* to acute sinusitis, tracheobronchitis, bronchiolitis, and bronchopneumonia is established. Although it seems reasonable to infer from the results of experiments that *B. influenzae* is the specific cause of influenza, a definite conclusion is not permissible, since it is impossible to determine whether the respiratory disease produced in monkeys with *B. influenzae* is identical with influenza or merely similar to it. The experiments are advanced, therefore, as evidence in favor of the etiologic relation of *B. influenzae* to influenza.

Pathology of Experimental Influenza Lesions.—The pathologic changes observed by Cecil and Blake in experimental influenza differ in no essential respect from those which occur in human influenza. In both instances the disease manifests itself as an acute catarrhal inflammation of the upper respiratory tract, extending usually from the nasal cavities down into the trachea and bronchi. In both diseases the accessory sinuses are often involved and a secondary bronchopneumonia is a frequent complication.

Heteroplastic Bone Formation.—Experiments on rabbits were made by Asami and Dock. The results lead them to conclude that bone formation in the rabbit kidney with ligated vessels takes place (*a*) through the activity of young fibroblasts which accumulate to form a membrane-like structure; (*b*) subsequently by direct ossification of hyalin connective tissue in continuity with preformed bone; and (*c*) through erosion of lime placques by granulating tissue and lying down of lamellar bone by cells derived from fibroblasts. Bone formation in the rabbit kidney begins not in direct contact with calcium deposits, but in the loose vascular connective tissue close under the transitional epithelium of the calices. With autotransplanted ear cartilage of the rabbit there is an active new formation of cartilage in the connective tissue which surrounds the transplants, and the bone is formed by the fibroblasts from the perichondrium which erode and invade the calcified areas in this new cartilage. The process of bone formation in the kidney is similar to that found in normal membranous ossification, while with the transplanted ear cartilage the process is identical with endochondral ossification.

Journal of Immunology, Baltimore

November, 1920, **5**, No. 6

*Comparison of Smear, Culture and Complement Fixation in Chronic Gonorrhea in Women. J. D. Smith and M. A. Wilson, New York. —p. 499.

*Experiments on Production of Antihuman Hemolysin with Special Reference to Immunization with Erythrocytes Sensitized with Heated Serum. M. Matsumoto, Philadelphia.—p. 507.

*Nonspecific Production of Antibodies. M. Matsumoto, Philadelphia.—p. 517.

*Sachs-Georgi Precipitation Test for Syphilis. T. G. Hull and E. E. Faught, Springfield, Ill.—p. 521.

Study of Mechanism of Human Isohemagglutination. H. L. Koeckert, Cleveland.—p. 529.

*Immunization with Blackleg Aggressin. T. P. Haslam, Sioux City, Ia.—p. 539.

Study of Specificity of Absorption of Antibacterial Precipitins. C. Krumwiede and G. M. Cooper, New York.—p. 547.

Value of Complement Fixation Test in Gonorrhea.—The conclusions reached by Smith and Wilson are that the gonococcus complement fixation test is of undoubted value in chronic gonorrheal infections. In acute and early subacute infections it is on a par with the Wassermann test in the initial lesion stage prior to development of the secondary. A nongonorrheic does not give a positive complement fixation test. A gonorrheic may give a negative test in certain stages of the disease.

Immunization with Erythrocytes.—Matsumoto states that that immunization of rabbits with unwashed and washed human erythrocytes by intravenous injection every five days, produced similar results in influence on body weight, mortality, hemagglutinin and hemolysin production. Exposure of human erythrocytes to antihuman serum diluted 1:10 and heated at 70 to 80 C., reduces susceptibility to agglutination and increases susceptibility to hemolysis; immunization of rabbits with these sensitized erythrocytes produced results similar to those observed with plain washed corpuscles. The stroma of human erythrocytes injected intravenously into

rabbits may prove fatal; solutions of erythrocytes in distilled water largely free of stromata (shadow corpuscles) were better borne.

Nonspecific Production of Antibodies.—The immunization of rabbits with washed human and sheep corpuscles resulted in the production only of specific agglutinins and hemolysins for human and sheep corpuscles, respectively. Occasionally rabbits showed an apparent slight increase of nonspecific hemolysin or agglutinin, but these were so slight and irregular as to be explained by the normal variation of natural antibodies or experimental error.

Modified Sachs-Georgi Test.—A modification of the Sachs-Georgi precipitation test for syphilis is described by Hull and Faught using clear blood serum and an alcoholic extract of beef heart, either cholesterinized or not. In their work the precipitation test agrees with the Wassermann test in 88 per cent. of the cases; in 7 per cent. it was more delicate, giving positive results where the Wassermann was negative; in 3 per cent. it was negative where the Wassermann was doubtful; in 2 per cent. it was negative where the Wassermann was positive. Treatment of the patient apparently affects the results of the precipitation causing it at times to come negative while the Wassermann still is positive. Attempts to determine whether the precipitate formed in this test was entirely responsible for the Wassermann reaction were unsuccessful.

Brain Culture Medium.—By substituting the brain recommended by von Hibler for the meat pieces used in Foth's medium, Haslam obtained a medium which seemed superior to either the "Hirnbrei" of von Hibler, or the "meat piece liver bouillon" of Foth. It was much more sensitive than guinea-pigs for detecting the presence of *B. chauveaui* in blackleg aggressin.

Journal of Mental and Nervous Diseases, New York

November, 1920, **52**, No. 5

Manometric Oculocompressor. J. Rubinowitch, Paris.—p. 385.
*Case of Hemangioma Cavernosum of Cerebrum. S. Uyematsu, Tokyo. —p. 388.
Psychiatry Before Hippocrates. J. Wright, London.—p. 399.
*Lethargic Encephalitis. J. Meyer, Chicago.—p. 409.

Hemangioma Cavernosum.—In Uyematsu's case no clinical symptoms were manifested. The details are given, the literature is reviewed and the opinions of various clinicians are discussed. The author advances the congenital theory in his case because of the presence of other congential structures in the central nervous system of the same person.

Lethargic Encephalitis.—Meyer reports two cases, from the blood of one of which a hemolytic streptococcus was isolated. Injected intravenously into rabbits and guinea-pigs, the organism failed to produce any effect. Attention is also directed to the fact that in one of these cases anesthesia was present. The patient first showed a left hemiparesis which disappeared and was followed by a paralysis of the right side. The early appearance of an ankle clonus opposite the paralyzed side, and the presence of a bilateral ankle clonus and a negative Babinski, were also points of interest and suggested involvement in one of the nuclei at the base or of the gray matter in the cord. Attacks of delirium occurred in both cases.

December, 1920, **52**, No. 6

Cerebellar Agenesis. Report of Two Cases. F. P. Moersch, Ann Arbor, Mich.—p. 465.
*Analysis of Suicidal Attempts. K. G. Lowrey, Boston.—p. 475.
*Contralateral Plantar Reflex. A. Gordon, Philadelphia.—p. 482.
Is There an Ideal Treatment for Morphinism? C. B. Pearson, Catonsville, Md.—p. 490.

Analysis of Suicidal Attempts.—Of 46 cases analyzed by Lowrey, 16 were cases of dementia praecox; 9 of manic depressive insanity; 5 of psychopathic presenility; 3 of psychoneurosis and the others scattered. In 14 cases the attempt was due to depression; in 7 to hallucinations or delusions; in 6 to escape persecution; in 7 to escape physical suffering or dread of mental disease. The methods used most often were cutting, gas and poison.

Contralateral Plantar Reflex.—Gordon maintains that the presence or absence of a contralateral reflex is an indication not only of the presence of lesions in the pyramidal tracts but also of the intensity of these lesions. It is, consequently, a valuable diagnostic phenomenon.

Journal of Orthopaedic Surgery, Lincoln, Neb.

December, 1920, **2**, No. 12

Congenital Malformations and Deformities of Hand. A. Steindler, Iowa City.—p. 639.
Principles of Treatment of Congenital Talipes Equino-Varus. R. C. Elmslie, London.—p. 669.
*System of Joint Measurements. W. A. Clark, Rochester.—p. 687.

System of Joint Measurements.—All joint movements are measured by Clark on a half circle are from 0 to 180 degrees. The zero end of this arc is toward the head and the neutral position is 180 degrees for all movements except rotation. For rotation, including pronation and supination, the zero end is toward the median body line (on the left for the spine) and the neutral position is 90 degrees. Extension is a movement toward 180 degrees and flexion toward 0 on the flexor half circle arc in the anteroposterior plane. Hyperextension is a movement toward 0 on the half circle arc on the extensor side of the joint in the anteroposterior plane. Abduction and adduction are both movements toward 0 in the lateral plane, the former on the half circle arc lying external to the joint, and the latter on the half circle arc lying internal to the joint. Internal rotation is toward 0 and external toward 180 degrees on the anterior half circle arc in the transverse plane. For the spine rotation to the patient's left is toward 0 and to his right toward 180 degrees. The number of degrees stated in records by this system indicates the limit of motion on the half circle scale and not the amount of motion.

Kentucky Medical Journal, Bowling Green

November, 1920, **18**, No. 11

Diphtheria Therapeutic Comparisons. R. B. Gilbert, Louisville.—p. 406.
Diphtheria from Standpoint of Family Physician. F. Brandies, Louisville.—p. 408.
Indications for Intubation in Diphtheria. B. E. Pirkey, Louisville.—p. 408.
Diphtheria from Standpoint of School Nurse. E. Bears, Louisville. —p. 409.
Diagnostic Methods of City Health Office in Diphtheria. V. Robbins, Louisville.—p. 410.
Complications. J. H. Pritchett, Louisville.—p. 411.
Value of Schick Test. H. E. Tuley, Louisville.—p. 412.
Fractures of Forearm. J. I. Taylor, Russellville.—p. 415.
Deferred Chronic Intermittent Versus Early Intensive Treatments of Syphilis. E. R. Palmer, Louisville.—p. 417.
Lateral Sinus Thrombosis with a Case Report. J. R. Peabody, Louisville.—p. 428.
Fragment of Steel Removed from Eye, After Two Years, with Magnet; Case Report. S. G. Dabney, Louisville.—p. 434.
Hysteria as It Affects Eye. A. O. Pfingst, Louisville.—p. 436.
Diagnosis. R. M. Rankin, Covington.—p. 443.
Venereal Clinic. R. Dade, Hopkinsville.—p. 446.
Medicine Past and Present. S. P. Alderson, Russellville.—p. 447.
Rabies. H. H. Hunt, Mayfield.—p. 448.
Arteriosclerosis. W. Z. Jackson, Arlington.—p. 450.

Medical Record, New York

Dec. 11, 1920, **98**, No. 24

How "Tuberculosis Schemes" Fail and Why. S. J. Maher, New Haven, Conn.—p. 967.
Epidemic of Lethargic Encephalitis. I. Abrahamson, New York. —p. 969.
Chemically Pure Anhydrous Dextrose as Therapeutic Agent. William H. Porter, New York.—p. 973.
What Is an Intoxicating Beverage? C. A. Rosewater, Newark, N. J. —p. 976.
Treatment of Certain Gynecologic Diseases with Radiation. J. T. Stevens, Montclair, N. J.—p. 979.
*Subluxation of Head of Radius. J. Grossman, New York.—p. 981.
*Method for Standardizing Knee Jerk Test and Its Measurement. G. F. Boehme, Jr., Los Angeles, Calif.—p. 982.
Drugs and Their Active Principles in Relation to Treatment of Disease. B. Robinson, New York.—p. 983.
Meningitis Serosa. R. A. Kildtuffe, Pittsburgh.—p. 984.
*Acute Veronal Poisoning Simulating Lethargic Encephalitis. E. MacLeod, Centralia, Wash.

Subluxation of Head of Radius.—Subluxation of the head of the radius, Grossman says, occurs only in children, generally between the ages of 8 months and 3 years. The mode of production and the subsequent picture, namely raising or dragging the patient by gripping the wrists and the apparent flaccid paralysis, are characteristic of this condition. It is often called "traumatic palsy" of the upper extremity. Extreme forcible supination is all the treatment required to overcome the subluxation. After-care is not necessary. As

relapses may occur, Grossman says, parents should be warned of the risk of dragging or lifting their children by gripping the wrists.

Standardizing Knee Jerk Test.—The test devised by Boehme is performed as follows: The patient is laid on his back on a regular examining table. The thigh is flexed on the abdomen to complete flexion. The knee is flexed on the thigh to a right angle. The leg is held with the nonpercussing hand preferably grasping the angle, holding the total limb in the position described. The quadriceps tendon is then carefully palpated to locate the tendon between the lower ankle of the patella and the tibial tubercle. It will present a moderate degree of tension. The area described is then percussed with the percussion hammer, when an extension movement of the leg on the thigh occurs. The spontaneousness of the reflex, the intensity, etc., can then be measured by the hand holding the leg in position. This measure gives a method of testing the knee jerk with constant factors: (1) As to position of the limb; (2) as to tension on the quadriceps; (3) as to mental inhibition.

Veronal Poisoning.—MacLeod's patient took fourteen 5 grain barbital (veronal) tablets in divided doses over a period of thirty-six hours and slept continuously for seven days. This prolonged sleep from veronal suggested to MacLeod its use in status epilepticus, with happy results from 30 grains in divided doses. In probably other mental conditions as morphinomania, etc., MacLeod suggests that a week's sleep would eliminate the pain and suffering from withdrawal of the drug.

Dec. 18, 1920, **98**, No. 25

Rummo-Ferranini Genito-Dystrophic Geroderma (Senilism), Lean Type, Due to Tardy Hereditary Syphilis. M. R. Castex and C. P. Waldorp, Buenos Aires, Argentina.—p. 1009.
Thymic Epilepsy. W. Browning, Brooklyn.—p. 1013.
Diathermy an Aid in Empyema. A. B. Hirsh, New York.—p. 1015.
Case of Leontiasis Ossea. J. E. Sheehan, New York.—p. 1017.
Dermoid Cyst of Mediastinum with Transmitted Pulsation. H. E. Hale, New York.—p. 1019.
Case of Chronic (Residual) Lethargic Encephalitis Simulating Paralysis Agitans Type, in Boy, Aged 16. J. H. Leiner, New York.—p. 1020.
Laboratory Experiments to Determine Value of Certain Agents in Connection with Surgical Operations. J. T. Gwathmey, New York, and E. S. Tibbets, Cumberland, Md.—p. 1021.
*Galvanopalpation. M. Kahane, Vienna.—p. 1026.
Partial Asphyxiation in an Infant Resulting from Inhalation of a Dusting Powder. L. Fischer, New York.—p. 1027.

Galvanopalpation.—Galvanopalpation is a method of testing the sensory and vasomotor nerves of the skin. It consists in the application for short intervals frequently repeated, of a needle-like anode electrode as sharply pointed as possible, to the part of the skin that is to be examined, while the indifferent electrode (the cathode) is applied to some other part of the body, e. g., the palm of the hand. The diagnostic importance of galvanopalpation consists in the fact that the cutaneous vasomotor and sensory reactions are of a secondary nature, being dependent on internal diseases, and that topically the reaction spots correspond to the site of the disease. Thus, for example, in an ulcer of the stomach, the reaction phenomena (reddening of the skin, etc.) will be limited strictly to the area of the skin over the ulcer, and there will be no reaction phenomena whatsoever elsewhere. A third point of great importance is this: the intensity of the reaction is proportional to the intensity of the irritation or inflammation in the subjacent tissue or organ, and consequently we may gain information as to the progress of the disease by studying the character and intensity of the reaction at regular intervals. The tissues and organs which Kahane says lend themselves to diagnosis by galvanopalpation are: on the head, the outlets of the trigeminus, the nose, the sinuses, and nasal cavities; on the neck, the vagus, the accessorius, and the sympathetic, the larynx, the thyroid gland, the cervical roots and the brachial plexus; in the thorax, the lungs, the heart, the aorta and the dorsal roots; in the abdomen, the superficial portion of the liver, the gallbladder, the anterior wall of the stomach, the large intestine, the appendix, the kidneys, the lumbar and sacral roots; on the extremities, the bones, joints, muscles, peripheral nerves (as far as they are directly under the skin). Galvanopalpation is of special value in those cases of abdominal disease in which the patient's statements are of no value as aids to the localization of the malady.

Minnesota Medicine, St. Paul

December, 1920, **3**, No. 12

Some Medical Traits and Their Consequences. J. H. Adair, Owatonna.—p. 561.
Application of War Methods of Treating Fractures to Those Occurring in Industrial Occupations. J. A. Blake and J. N. Worcester.—p. 565.
Relation of Chronic Gas Poisoning (Warfare) of Lungs to Pulmonary Tuberculosis. F. W. Spicer, Duluth.—p. 573.
Surgical Treatment of Cerebral Hemorrhage in New-Born. A. C. Strachauer, Minneapolis.—p. 577.
Dilatation of Upper Portion of Internal Saphenous Vein Simulating Femoral Hernia. W. E. Sistrunk, Rochester.—p. 583.
*Value and Significance of Blood Pressure in Obstetrics. A. G. Schulze, St. Paul.—p. 585.
Wassermann Test; Plea for Standard Method. J. C. Ohlmacher, Vermilion, S. D.—p. 590.

Blood Pressure in Obstetrics.—In a series of 145 consecutive cases Schulze found that the average of seventy-five blood pressure readings taken when the patient was at full term but not in labor was 123.5; the average of eighty-six readings taken as near as possible in the second stage of labor was 133; and the average of 104 readings taken as near as possible three hours after labor was 120 mm. A series of blood pressure readings properly taken rather than a series of urine analyses, serve as an index of the eclamptic or the noneclamptic condition of the patient. If the blood pressure is below 100 be prepared for shock; if above 150 it is no longer to be regarded as normal. A moderately high blood pressure that shows no tendency to mount and which is not accompanied by symptoms of eclampsia is not necessarily serious; a pressure, even if low and unaccompanied by symptoms of eclampsia, but which does show a tendency to mount, should be regarded with suspicion.

Missouri State Medical Association Journal, St. Louis

December, 1920, **17**, No. 12

Traumatic Aneurysms. H. S. Valentine, Kansas City.—p. 475.
Chronic Dacryocystitis Treated by Curettage and Rapid Dilatation. John Green, Jr., St. Louis.—p. 480.
Subconjunctival Injections of Mercury Cyanid in Treatment of Ulcers and Infected wounds of Cornea. W. H. Schutz, Kansas City.—p. 482.
The Eye, the Window of the System. W. F. Hardy, St. Louis.—p. 485.
Vesico-Intestinal Fistulas. H. S. MacKay, St. Louis.—p. 489.
Deep Therapy with Roentgen Ray. E. C. Ernst, St. Louis.—p. 491.
Case of Erythromelalgia Treated with Adrenalin Chlorid. J. I. Tyree, Joplin.—p. 497.

New York Medical Journal

Dec. 18, 1920, **112**, No. 25

*Case of Alkalosis and Impairment of Excretory Power of Kidneys. J. L. Morse, Boston.—p. 965.
*Use of Atropin in Treatment of Hypertonic Infant. A. D. Kaiser, Rochester, N. Y.—p. 971.
Class Method of Treating Malnutrition in Children. W. H. Donnelly, Brooklyn.—p. 973.
Six Months' Experience with Nutrition Class. L. M. Ruderman, Brooklyn.—p. 976.
Simplified Infant Feeding. F. H. Richardson, Brooklyn.—p. 977.
Xeroderma Pigmentosum. I. S. Ravdin, Philadelphia.—p. 985.
Empyema in Children. E. Glenn, Philadelphia.—p. 987.
Weak Foot in Child. H. Scheimberg, Brooklyn.—p. 998.

Alkalosis.—Morse's patient, a girl, aged 10 years, had had a renal pyelitis for four years. Following the administration of sodium bicarbonate she developed spasmophilia, also attacks of slight spasm of the larynx. It was believed that the spasmophilia was due to the sodium bicarbonate. The sodium had driven out the calcium, and on account of the disturbance of the normal balance between sodium and potassium on the one side and calcium and magnesium on the other, the spasmophilia had developed. Under the active treatment with glucose and water by mouth and by rectum and with water subcutaneously all signs of the spasmophilia were gone by the end of a week.

Atropin in Hypertonic State.—Kaiser says the method of treatment outlined by Haas has given him the best results. A 1:1,000 solution is used. The usual dose to begin with is 1 drop or $\frac{1}{4,000}$ grain in each feeding, or in a small amount of water before breast feedings. The dose is increased to 2 drops for the next twenty-four hours if no untoward symptoms develop. In order to procure the desired relief of symptoms 3 or 4 drops six or seven times a day, may be necessary. The average hypertonic infant will tolerate from $\frac{1}{50}$ to $\frac{1}{25}$ grain atropin a day.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology. Liverpool

Nov. 27, 1920, **14**, No. 2

*Tartar Emetic in Guinea-Worm Infections. J. W. S. Macfie.—p. 137.
Three Cases of Cardiac Aneurysm in Native Boys of the Gold Coast. J. W. S. Macfie and A. Ingram.—p. 147.
Strongylidae in Horses. W. Yorke and J. W. S. Macfie.
IX. Cylicostomum Tridentatum sp.n.—p. 153.
X. On the Genus Poteriostomum, Quiel.—p. 159.
XI. Species Found in West Africa and Jamaica.—p. 165.
XII. Cylindropharynx Rhodesiensis, sp.n.—p. 169.
XIII. Cylicostomum Triramosum, sp.n.—p. 175.
Fish and Mosquito Larvae in Bengal, Bihar and Orissa, India. T. Southwell.—p. 181.
Ceratopogonne Midges of Gold Coast with Descriptions of New Species. Part I. H. F. Carter, A. Ingram and J. W. S. Macfie.—p. 187.
Ceratopogonne Midges of Gold Coast with Descriptions of New Species. Part II. H. F. Carter, A. Ingram and J. W. S. Macfie.—p. 211.
*Further Experiments with Anopheles Plumbeus, Stephens; Its Infection with P. Falciparum in England. B. Blacklock and H. F. Carter. —p. 275.

Tartar Emetic in Guinea-Worm Infections.—Macfie states that the intravenous injection of 4 grains tartar emetic is sufficient in many cases to kill a guinea-worm and the embryos in it. But to effect a permanent cure he suggests to give every other day an injection of 1 grain tartar emetic until a total dose of 6 gains has been administered. In the event of relapse or recurrence, a second course should be given.

Anopheles Experiments.—Of twelve females of *Anopheles plumbeus* fed once on one or other of two cases of simple tertian malaria (*P. vivax*), and subsequently kept at room temperature (maximum 22 C.; minimum 13 C.) none became infected. Of twelve females of *A. plumbeus* fed once on a case of malignant tertian malaria (*P. falciparum*), and subsequently kept at 28 C., none lived longer than eight days after the infected feed; one contained oocysts in the midgut.

British Medical Journal, London

Dec. 4, 1920, **2**, No. 3127

Psychopathology and Dissociation. W. Brown, London.—p. 847.
*Subacute Infective Endocarditis. T. F. Cotton, London.—p. 851.
Action of Antimony Tartrate in Intravenous Injections. J. B. Christopherson.—p. 854.
Antimony in Leprosy. F. G. Cawston.—p. 855.
Two Cases of Double Glioma Retinae. A. R. Moodie.—p. 855.
*Treatment of Ascites by Drainage. J. O'Connor.—p. 856.

Subacute Infective Endocarditis.—Fifty-five cases form the basis of Cotton's paper. The exercise tolerance was poor in all. Fever was present in all but one. It was the rule for these patients to have a toxic appearance. The appearance of these patients often suggested a greater degree of anemia than the actual blood examination revealed. The spleen was enlarged and easily palpable in forty-eight. In five no mention was made of its size; in two it could not be felt. Clubbed finger tips was one of the most striking clinical features of the disease in these patients. Petechiæ were observed in forty. Osler's nodes, small tender and painful spots of nodular erythema on the hands and feet, disappearing within a week, were observed in seven cases. Emboli obstructing larger vessels were noted in seven cases. The urine in thirty-four cases was albuminous. A bacteriologic examination of the blood was made in twenty-four cases. Micro-organisms were grown in eleven cases. Streptococci were found in eight cases; streptococci and staphylococci in one case; staphylococci alone in one case; and a gram-positive diplococcus in one case. In every instance, the diagnosis of infective endocarditis was made without the aid of the bacteriologic report. Of the fifty-five patients, forty-four are known to have died with an average duration of symptoms of fourteen months. The cause of death in twenty-six cases was gradually increasing heart failure, acute heart failure in five, the sudden onset of auricular fibrillation and death in a few hours in one. Three patients died following a hemiplegia; one patient died from pulmonary embolism and one from a streptococcus pneumonia. The pathologic changes revealed at necropsy were typical in every instance of subacute infective endocarditis.

Continuous Drainage in Ascites.—O'Conor reports two cases in which continuous drainage with a rubber catheter apparently effected a cure. One was a case of hepatic cirrhosis. Drainage ceased on the fourth day. The tube was retained until the twelfth day, but nothing more exuded. The patient still was in good condition one year later. The second case was one of cardiac hepatic block, incompetence and ascites. Drainage ceased in the sixth day.

Edinburgh Medical Journal

December, 1920, **25**, No. 6

Carcinoma of Postericoid Region and Upper End of Esophagus. A. L. Turner.—p. 345.
Pellagra. E. J. Wood.—p. 363.
Influenza. W. D. D. Small.—p. 375.
*Age and Sex Incidence of Pernicious Anemia. J. Eason.—p. 389.

Age Incidence of Pernicious Anemia.—On investigation Eason found that Edinburgh hospitals show the largest numbers of cases of pernicious anemia occurring between the ages of 45 and 59. Until the age of 50 the rate of incidence inclines to be higher in the female than in the male. Thereafter, the rate is definitely higher in males than in females. It appears that senility is a more important etiologic factor than has hitherto been generally recognized. There appears to be an increasing liability to pernicious anemia with advancing years.

International Journal of Public Health, Geneva

November, 1920, **1**, No. 3

War and Social Prophylaxis of Tuberculosis. L. Bernard.—p. 281.
Leper Colonies and Improved Treatment in Control of Disease. L. Rogers.—p. 287.
Scurvy in World War. A. F. Hess, New York.—p. 302.
Treatment of Typhus Fever. G. C. Shattuck.—p. 308.
Antimalaria Campaign at Fiumicino (Rome), with Epidemiologic and Biologic Notes. M. Selia.—p. 316.

Japan Medical World, Tokyo

Oct. 23, 1920, **10**, No. 43

Progress of Medical Science in Brazil. A. Neiva.—p. 935.

Oct. 30, 1920, **10**, No. 44

Nature of Paralysis Due to Polished Rice Disease in Domestic Fowls. G. Kato.—p. 955.

Nov. 6, 1920, **10**, No. 45

Nature of Paralysis Due to Polished Rice Disease in Domestic Fowls. G. Kato.—p. 975.
Structure of Nucleus. O. Tamura.—p. 976.

Nov. 13, 1920, **10**, No. 46

*Structure of Nucleus. O. Tamura.—p. 995.
Calorimetric Metabolism of Japanese Sucklings. Y. Yano.—p. 995.
Clinical Experiences with Carmol B, a New Urologic Preparation. H. Wakimoto.—p. 996.

Nov. 20, 1920, **10**, No. 47

Intestinal Parasites Among Choreans: Abnormal Forms of Eggs. H. Kobayashi.—p. 1015.
Autoserum Therapy of Gynecologic Cases. N. Ishikawa.—p. 1016.

Structure of Nucleus.—Tamura disagrees with the generally adopted views on the structure of the nucleus, that the chromatin, the nucleoli, the nuclear membrane and the linin, are independent bodies having different structures. He affirms that the substance that makes up the nucleus consists of two kinds, to which he gives the name ectokarpoplasma and endokaryoplasma. The ectokaryoplasma is a basophilic protoplasmic substance found in the outer structure of the chromosome, the nuclear membrane and the intranuclear reticulum. The interior is formed by the ectokaryoplasma of the reticulum which gives facilities for the endokaryoplasma is an acidophilic substance found in the internal structure of the chromosome. It is also found in the internal structure of the reticulum and more or less agglomeration of this substance in the reticulum gives features of the granular appearance seen under the microscope.

Medical Journal of Australia, Sidney

Oct. 23, 1920, **2**, No. 17

Deafness in Children. G. E. Rennie.—p. 391.
Causes of Blindness in Children in New South Wales. J. C. Halliday. —p. 392.
Care of Blind and Deaf Children. S. Harrison.—p. 393.

Hymenolepsis nana in North Queensland. P. A. Maplestone.—p. 394.
Two Cases of Abdominal Injury. F. O. Stokes.—p. 395.
General Ankylosis Following Osteo-Arthritis. J. C. Windeyer.—p. 396.

Oct. 30, 1920, **2**, No. 18

Impressions of New Zealand from a Medical Practitioner's Standpoint. E. G. Blaxland.—p. 407.
Case of Anne Boleyn. C. MacLaurin.—p. 413.
Rupture of the Coronary Artery. H. L. Kesteven and C. A. Verco. —p. 416.
Case of Cerebrospinal Meningitis. E. True.—p. 417.

Nov. 6, 1920, **2**, No. 19

Four Years' Work in Gynecologic Wards of Sydney Hospital, 1915-1918. R. Worrall.—p. 429.
Case of Hydatid Mole. R. I. Furber.—p. 434.

Practitioner, London

December, 1920, **105**, No. 6

Medical Aspects of Carcinoma of Breast. R. Hutchison.—p. 385.
Insanity and Responsibility for Crime. W. A. Brend.—p. 390.
Recent Work on Anesthetics. J. Blomfield.—p. 402.
Beginning of Disease. O. C. Gruner.—p. 411.
*Afferent Nerve Supply of Female Genito-Urinary Organs and Bowel. W. A. Ogilvy.—p. 421.
Different Modes of Auscultation. C. W. Chapman.—p. 430.
Wassermann Reaction. C. Lundie.—p. 431.
*Diet After Gastro-Enterostomy. A. MacLennan.—p. 435.
*Intestinal Stasis: A Suggestion. J. C. Watt.—p. 437.

Nerve Supply of Female Genito-Urinary Organs.—Ogilvy is of the opinion that the tenth thoracic nerve supplies the functionating portion of the kidney, the ovary and the small bowel, all of which are highly functionating; that the eleventh thoracic nerve supplies the upper branching extremity of the ureter, the uterine tube and the ascending and transverse colons; the twelfth thoracic nerve supplies the ureter, the uterus and the descending and sigmoid colons, all of which are comparatively passive carriers, except for the absorbing function of the large bowel; that the first lumbar nerve supplies the bladder, rectum and uterus, all of which are organs of convenience; and that the third and fourth sacral nerves supply the trigone and urethra, the os and vagina, and the anal canal, all of which are outlets.

Diet After Gastro-Enterostomy.—As most of the troubles following gastro-enterostomy are due to bilious regurgitation, and this misfortune is proportionate to the amount of atony present in the stomach, MacLennan states that a diet which tends to contract the stomach is indicated. He allows champagne, brisk beer, a sparkling or sour wine, as much raw fruit as the patient likes, especially the gooseberry; condiments of all kinds; addition of vinegar to the lavage is a cure for bilious regurgitation, at any rate for the time; all edible vegetables, provided they are properly cooked or properly chewed. Smoking in moderation after food is permissible.

Cause of Intestinal Stasis.—Watt blames the cecum for constipation. Being what he terms a "dead end," it constitutes a possible seat of complete and permanent stagnation; and being placed head downward, it is required not only to empty itself but to assist in the emptying of several inches of colon, by its own unaided exertions, against the weight of its own contents, and those of the ascending colon (to a variable extent). To relieve the stasis, Watt amputates the cecum obliquely to the long axis of the ascending colon, at the lowest point at the shortest possible distance below the ileocecal valve, the uppermost point midway between the two outer longitudinal bands, thus as much as possible eliminating the culdesac. The source of toxic absorption being removed, the ileocecal valve would be able to sustain any weight of the colon contents, and to prevent regurgitation.

Archives des Maladies de l'Appareil Digestif, Paris

November, 1920, **10**, No. 11

*Etiology of Gastric Achylia. K. Faber (Copenhagen).—p. 641.
Radiodiagnosis of Gallstones. Therre.—p. 654.
*Dyspeptic Coma with Gastric Ulcer. L. Timbal.—p. 664.
*Hemorrhagic Nonulcerative Rectocolitis. A. S. Alivisatos.—p. 671.
Severe Intoxication from Bismuth Carbonate Contrast Meal. V. Danulescu and D. Simici.—p. 684.

Etiology of Gastric Achylia.—Faber here amplifies his views which were summarized in these columns, July 3, 1920, p. 72. He thinks that there are so many possible exogenous causes for achylia that it is not necessary to assume a congenital constitutional anomaly. Toxic action from any infection, especially intestinal, is liable to damage the stomach as it damages other glandular organs. It may act directly or indirectly on the secreting apparatus of the stomach, and sooner or later may entail irreparable injury. He attributes to toxic action likewise the chronic achylia found in 50 per cent. of cases of exophthalmic goiter and of polyarthritis. The achylia in these two groups may not present symptoms at any time during the course of the disease, thus resembling in every respect the cases generally considered idiopathic or constitutional.

Fatal Coma of Dyspeptic Origin.—In Timbal's two cases the chronic ulcer in the stomach had induced intense pains, frequent vomiting and profound inanition from the almost complete intolerance of the stomach. The cerebral symptoms were drowsiness in one, gradually passing into the fatal coma; in the other case impairment of vision and delirium ushered in the coma, with death the second day. The patients were men of 50 and the ulcer symptoms were of several years' standing. The pylorus was permeable in the second case, but glycosuria testified to insufficiency of the liver. Dyspeptic coma can be combated with large doses of sodium bicarbonate by various routes, but it is almost inevitably fatal.

Hemorrhagic Rectocolitis.—Alivisatos describes a case of mild nonulcerative rectocolitis, a recurring case, and a third case with a cancer graft. The diarrhea and the hemorrhage were arrested in the first two by injection of bismuth subgallate and dieting, but the third proved rebellious until the bowel was flushed from above by appendicostomy. This nonulcerative type is often tenacious but under the above measures kept up possibly for months, a cure is usually realized.

Bulletin de l'Académie de Médecine, Paris

Oct. 19, 1920, **84**, No. 32

Infant Welfare Work in Small Town. Vidal.—p. 143.
Improved Technic for Preparing Antiserums. J. W. Howard (Buenos Aires).—p. 147.
Lethargic Encephalitis Sequels. Rémond and Lannelongue.—p. 149.
Tuberculous Myocarditis. E. Lenoble.—p. 151.

Nov. 16, 1920, **84**, No. 36

*The Soil in Infectious Encephalitis. J. Lépine.—p. 225.
*Secondary Malignant Tumors in Bones. P. Delbet.—p. 231.
*Children's Seashore Sanatorium. E. Ausset.—p. 233.

The Soil in Infectious Encephalitis.—Lépine explains why lethargic encephalitis is not more actively contagious, ascribing this to a lack of receptivity on the part of the nervous system in the contacts. In all his fifty cases he could distinguish a predisposing factor almost without exception, excessive physical or emotional strain, a constitutional nervous or mental taint, a tendency to migraine, or the onset or conclusion of the genital phase of women's life. Netter in the discussion stated that persons in the environment may and probably do develop the infection, but in a mild, abortive form, sparing the brain, so that it is not recognized. Only when the nervous system is substandard, permanently or temporarily, does the disease manifest itself as encephalitis. He has also noted the peculiar gravity of the disease in the pregnant.

Secondary Tumors of Bones.—Delbet refers to tumors in bones which seem to be primary but which in fact are metastases that have found a more favorable soil for their development than the primary tumor had encountered, and hence the secondary tumor far outshadows the primary growth. He has observed a number of cases of this kind, the sarcoma in the long bone causing fracture as almost the first sign of its presence. He regards a sarcoma with spontaneous early fractures as suspicious of a primary localization elsewhere, and he searches scrupulously for this before attempting any mutilating operation.

Child Welfare Work in France.—Ausset describes the fine results realized at the Zuydcoote sanatorium on the sea, near the Belgian line, where almost 1,700 children have regained health and strength since the war, "thanks," he adds, "to our friends, the Americans, who have made it possible for so many children to have their tottering health restored and who have covered the liberated regions with infant welfare stations."

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Bulletin Médical, Paris

Nov. 13, 1920, **34**, No. 53

*Tuberculosis in Older Children. P. Armand-Delille.—p. 999.
*Spurious Tuberculosis of Psychopathic Origin. M. de Fleury.—p. 1003.

Tuberculosis in Older Children.—Armand-Delille concludes this postgraduate lecture with the statement that our efforts in prophylaxis should be devoted to protecting children against repeated exposures to large numbers of tubercle bacilli. Among the other signs discussed, he says of augmented transmission of the whispering voice in the interscapulovertebral zone—d'Espine's sign—that he has found it valuable in corroboration of other signs. Treatment of tuberculosis in children must be almost exclusively physiotherapy, but it may give very fine results if it takes advantage of the natural resisting forces of the organism, and stimulates the defensive reactions. He mentions among others a case of tuberculous peritonitis cured by heliotherapy in the heart of Paris in a court surrounded by five-story buildings.

Spurious Tuberculosis.—Summarized Dec. 25, 1920, p. 1806, when published elsewhere.

Bulletins de la Société Médicale des Hôpitaux, Paris

Oct. 29, 1920, **44**, No. 32

*Treatment of Acute Purulent Pleurisy. M. Renaud.—p. 1251. Cont'd. Decalcification in Neurasthenia. H. Dufour.—p. 1261.
*Early Joint Lesions in Gonococcus Rheumatism. Id.—p. 1262.
Trophedema with Sacrum Bifidum. A. Léri.—p. 1263.
*Unilateral Hypertrophy of Skull Bones. A. Léri.—p. 1266.
*Vaccine Treatment of Serous Meningitis. Delahet.—p. 1272.
Autochthonous Pernicious Malaria. P. E. Weil and Plichet.—p. 1276.
Prognosis of Epidemic Encephalitis. R. Cruchet et al.—p. 1279.

Treatment of Acute Purulent Pleurisy.—Renaud deplores the mistake so frequently made in treating acute purulent pleurisy without regard for the fact that it is always the reaction of the pleura to some lesion in the lung. The nature and the distribution of this pulmonary lesion are what determines the pleurisy. The disease is not in the pleura but in the lung. He cites some instances to show that pleurotomy is not only useless but that it may do direct harm in these cases. The prognosis depends on the process in the lung. He has never encountered a case of an acute pleuropulmonary process becoming chronic.

Gonococcus Rheumatism.—Dufour recalls the tenacious localization of the rheumatism in the same joint; the arthritis with true rheumatism shifts about. The pain with the former is also more intense and it is spontaneous, persisting even in repose. Certain points in the joint are tender on palpation. The roentgen ray shows further pronounced decalcification in a few weeks of the joints thus affected.

Hemicraniosis.—Léri applies this term to the congenital deformity from hyperostosis limited to one half the skull. The territory of the trigeminal nerve is the region affected, and in the few cases of the kind on record an intracranial tumor developed in time, an angiolithic sarcoma of the dura. Léri reports another case which seems to belong to this category as the vision of the boy of 10 is imperfect on the side of the hyperostosis, and the movements of the eye are abnormal. In this group of cases the tumor did not manifest itself till in the twenties, so he discusses whether there is a probability of a tumor developing later in this boy. In Spiller's and Parhon's cases the deformity was not congenital, and the tumor was not always on that side.

Anaphylactic Meningitis.—Delahet's case confirms that in addition to the urticaria, arthritis, arthralgia and myalgia sometimes observed as manifestations of anaphylaxis, an anaphylactic meningitis is also possible, from overlong antimeningococcus serum treatment. It may develop immediately after the injection or not until several days later; in the latter case it is usually mistaken for a relapse of the primary meningitis. This antiserum meningitis may keep up, with intermissions, for some time. The puriform aseptic nature of the spinal fluid should suggest it, but only chemical analysis of the fluid is decisive; this discloses that the sugar content is normal or above, sometimes enormously high, in contrast to the subnormal sugar content with active meningococcus meningitis. Effectual treatment requires the neutralizing of the precipitin which is formed in every spinal fluid after several intraspinal injections of antimeningococcus serum. When more of the antiserum is injected, a flaky precipitate is thrown down, extremely irritating for the nerve centers. Desensitization can be realized by subcutaneous injection of a mixture of the patient's spinal fluid and horse serum, supplemented by intraspinal injection of the patient's own blood serum as a kind of vaccine. This accomplished the purpose in the case described. The seric meningitis which had kept up for two months, without any signs of spontaneous decline, became attenuated at once after the intraspinal injection of the patient's own blood serum. The case teaches further that with persisting meningitis which does not seem to be due to partitioning off of the infectious process, no further intraspinal injections of the antimeningococcus serum should be made without testing the sugar content of the spinal fluid. If this is above or below normal, we will know whether there is merely irritation or persisting infection.

Encéphale, Paris

September, 1920, **15**, No. 9

Contracture from Peripheral Facial Paralysis. D. Noica.—p. 521.
*Acute Mental Confusion in Pneumococcus Infection. H. Damaye.—p. 529.

October, 1920, **15**, No. 10

Atrophy of Muscles in General Paresis. Briand and de Fursac.—p. 553.
Hereditary Cerebellar Ataxia; Two Cases. Benon and Lerat.—p. 563.

Infectious Mental Confusion.—Damaye reports four cases which demonstrate that certain cases of acute delirium with hallucinations are the result of a septicemia acting on an organism debilitated by alcoholism, exhaustion, extreme debility or sitophobia. Saprophytes may assume virulence on account of the depressed vitality or fatty or amyloid degeneration of viscera. Treated energetically and in time, this infectious delirium may be cured, but otherwise the heart breaks down under the strain. Necropsy then shows the lesions common with acute psychoses. In two of his four cases the women soon died. The course and the lesions were alike in both, and they were in the hospital the same week. The two other patients were men, both addicted to liquor, and both recovered. The pneumococcus was cultivated from the blood in all the cases.

Gynécologie et Obstétrique, Paris

1920, **2**, No. 2

Spontaneous Delivery After Cesarean Section. A. Grosse.—p. 81.
*The Very Small Newborn. E. Hauch and Erna Ruge.—p. 84.
*Chancre of Cervix of Gravid Uterus. P. Lantuéjoul.—p. 110.
*Operation for Inversion of Uterus. R. Zaletel.—p. 120.

Spontaneous Deliveries After Cesarean Section.—The section was done in Grosse's case on account of an ovarian cyst impeding delivery, thirty hours after the first signs of labor. The woman passed through three normal deliveries at term with large children thereafter, without mishap, although some of the linen threads used for the interrupted sutures of the uterus wall (exclusive of the mucosa) had been expelled several months afterward.

The Exceptionally Small Newly Born.—Hauch and Ruge state that in a recent nine year period, 3.8 per cent. of the infants born in the Copenhagen maternity weighed less than 2.050 gm.; only 50.3 per cent. of them survived the first twenty-four hours. These small children are liable to be chilly, so that it is better to defer washing until they are a few days old. Twins and the infants of mothers with nephritis were the smallest, and they seemed to be born starved, as they increased rapidly in weight with proper nourishment. Only fifty-nine of the 262 surviving were traced later; forty-two of them had rachitis, but later they developed normally, and the thirty-five personally reexamined seemed to be normal in mind and body except that two were unusually small and one was an idiot. In the service, 14 per cent. of these exceptionally small children died and 24 per cent. died within the first year, but the proportion of survivors has been higher since the incubation chamber has been fitted up instead of the single incubators formerly in use. They add that there should be a special service for prematurely born infants who are not sick but only a little feebler than normal.

Chancre of Cervix Impeding Delivery.—In Lantuéjoul's case the chancre had persisted for five months, and labor began at

the eighth month of the pregnancy, just after the woman had been seen for the first time. After twenty hours of ineffectual labor, the child was delivered by vaginal cesarean section as there was no time to wait for medical treatment of the chancre. He cites six similar cases, all confirming the necessity for acting promptly to deliver the woman as there is scarcely any chance of the cervix dilating enough for delivery. The lesion on the cervix may be mistaken for ordinary ulceration, soft chancre or incipient epithelioma, so that excision of a scrap is often advisable for examination. Other syphilitic lesions elsewhere may give the clue. Secondary syphilitic sclerosis of the cervix presents the same indications as the chancre. He adds that vaginal cesarean section allows the greater chance for saving the uterus, which is justified the more as the dystocia is essentially transient, the cause of it subsiding under medical measures. Abdominal hysterectomy is advised at once if the woman has been long in travail and serious infection is suspected. The syphilitic lesions of the cervix healed readily under specific treatment when the pregnancy was terminated.

Operative Treatment of Inversion of the Uterus.—Zaletel makes a crescent-shaped incision in the roof of the anterior vagina, opens the uterovesical reflection of the peritoneum, and, putting the left forefinger in the funnel formed by the inverted uterus, he incises the anterior wall of the uterus on the median line. With the right hand the uterus is then reduced and the fundus is drawn forward, ligating and dividing the tubes, and interposing the body of the uterus between the bladder and the roof of the anterior vagina. He says that this technic is applicable only after failure of conservative measures. It avoids danger of adhesions to the rectum; the uterus is usually injured so much by the inversion that such adhesions are almost inevitable. It also prevents cystocele and prolapse later, while the technic is simple and easy.

Journal de Médecine de Bordeaux

Nov. 25, 1920, **91**, No. 22

*The Oculocardiac Reflex in Surgery. J. Guyot and G. Jeanneney.—p. 591.
Milian's Method of Treating Scabies. G. Petges.—p. 593.
*Meningeal Hemorrhage in Uremia. A. Chabé.—p. 596.
The Factors in Panic. Le Meillour.—p. 598.
Medical Aid in War Devastated Regions. Hamilton.—p. 605.
Reform in University Instruction. R. Cruchet.—p. 608.

The Oculocardiac Reflex from Surgical Standpoint.—Guyot and Jeanneney warn that the test for the oculocardiac reflex must be applied with caution, as it may be dangerous under certain exceptional circumstances. But when due caution is observed, it may be found of great assistance in estimating the condition before an operation. When this reflex is normal, the operator can proceed with confidence, but inversion of the normal response testifies to an upset of the balance between the sympathetic and the vagus, the influence of the former predominating. This is a condition found in certain forms of shock. When the reflex is abolished, this is a sign of insufficiency of centers in the medulla, etc., and imposes the need for extreme caution in the intervention. They reiterate that the surgeon should test for this reflex when he has reason to suspect vagotonia. Chloroform should be proscribed with vagotonia; even with ether, the vagotonia should be combated by injection of atropin twenty minutes before the anesthesia. This blocks the pneumogastric and thus wards off the syncope from inhibition which menaces with vagotonia. It has the further advantage of reducing secretion of mucus. They commend a mixture of 0.5 mg. atropin sulphate with 1 cg. morphin in 1 c.c. of distilled water. Other uses for the oculocardiac reflex are to facilitate examination of the heart by the bradycardia it induces, in study of the thyroid, and of organs in the thorax and abdomen, etc.

Meningeal Hemorrhage in Uremia.—Chabé insists that meningeal hemorrhages in the course of uremia are more common than realized, the symptoms from them being ascribed to uremic poisoning of the nerve centers. Lumbar puncture is the only clue, as he shows by a typical example reported in a man of 53 with chronic nephritis without edema. The sudden and alarming meningeal symptoms kept up for three days before lumbar puncture revealed almost pure blood in the spinal fluid; 15 c.c. were withdrawn, the patient having evidently had a subarachnoid hemorrhage just as he had had a severe epistaxis two weeks before. Three days later 20 c.c. of the still hemorrhagic spinal fluid were withdrawn and recovery rapidly progressed. Chabé reiterates that meningeal hemorrhage is by no means always fatal, and many conditions of coma and excitability in uremia may have been due to this cause, usually curable if taken in time.

Journal d'Urologie, Paris

August, 1920, **10**, No. 2

*Calculus Impacted in Ureter. André.—p. 89.
*Mobilization of Lower Bladder. L. Thévenot.—p. 99.
*Capillary Puncture of Bladder. R. de Berne-Lagarde and Ramos.—p. 107.
*Cystalgic Pyelitis. F. Pirondini.—p. 113.
Multiple Gunshot Wounds of Pelvis. M. Ferron.—p. 117.
Nephrectomy for Hydronephrotic Wandering Kidney. Z. do Amaral (Brazil).—p. 129.
*External Urethrotomy for Calculi in Children. Diamantis.—p. 133.

Calculi in the Ureter.—André's eight cases demonstrate anew that a calculus lodged in the ureter can often be brought out by introduction of a catheter into the ureter, even without injection of glycerin or other fluid. It may be necessary to leave the catheter in the ureter for a day or two, or reintroduce it several times, but final success invariably crowned his efforts. When the catheter reached the pelvis, he usually rinsed it out with a little weak silver nitrate solution which besides its antiseptic action stimulated the ureter to contract. With reflex anuria from calculi, the retention catheter in the kidney improves conditions for the operation if necessary. If the catheter is arrested by the calculus, the attempt should be repeated at different times if haste is not imperative. There is frequently more than one calculus, and any operation is liable to be incomplete. Recurrence is frequent with reflex anuria from calculi. In two women, with the impacted calculus small and low in the ureter, he succeeded in dislodging it by introducing into the ureter mouth a small laminaria tent, leaving it for twenty-four hours. Almost at once after removal of the tent, the calculus was spontaneously expelled.

Mobilization of the Lower Bladder.—Thévenot expatiates on the advantages of detaching all around the middle perineal aponeurosis to obtain access to the urethra and lower portion of the bladder. This permits their mobilization, and the surgeon does not have to work on them at the bottom of a deep well. The whole prostate-bladder region can thus be exteriorized as he illustrates, discussing the conditions for which it is specially applicable. The great progress realized by this *désinsertion ischio-pubienne totale de l'aponévrose périnéale moyenne*, as Rochet first published it (1916), was most evident, Thévenot remarks, in two cases of cancer of the prostate, one as large as a small orange. The stump of the bladder was sutured to the stump of the urethra with the greatest ease. The method gave constant satisfaction in war wounds of the region.

Dangers of Puncture of the Bladder.—Lagarde and Ramos mention that Albarran and Legueu have never punctured the bladder in their extensive experience, regarding it as dangerous and futile. But they have frequently had to treat complications of capillary puncture done elsewhere. A few cases of this kind are described, showing the almost inevitable diffusion of urine in the preperitoneal cavity. When it is absolutely impossible to evacuate the bladder by the natural route, an emergency cystotomy is indicated. This merely palliative intervention should be followed sooner or later with a second operation.

Cystalgic Pyelitis.—Pirondini has encountered three cases of an intense, painful and rebellious polyuria, all in women, with no objective findings except pain on pressure of the hypogastrium or anterior wall of the vagina. The cystoscope discloses nothing to explain the cystalgia, but catheterization of the ureters reveals the pyelitis responsible for the cystalgia. The condition might be called spurious tuberculous pyelitis or masked pyelitis, as the pyelitis does not manifest its presence in the usual direct way.

Calculus in Boy's Urethra.—Diamantis writes that urinary lithiasis in young children is frequent in Egypt, and serious

and permanent damage is often wrought by ill considered attempts to extract the calculus by the natural route. All that is necessary is a rapid axial incision down to the calculus, held between thumb and finger, and its extraction with scoop or forceps. No anesthesia is necessary, no suture, no ligature, but a flat dressing with a good suspensory. The urine escapes through the incision for five or six days but then normal micturition is reestablished and the result is perfect. The linear scar, parallel to the raphe, is almost invisible, and never induces a stricture.

Médecine, Paris

November, 1920, **2**, No. 2. Dermatology-Syphilography Number

*Skin Diseases and Syphilis in 1920. H. Gougerot.—p. 85.
*How to Cure the Syphilitic. L. Queyrat and M. Pinard.—p. 101.
*Inherited Syphilis and Dentition. R. Sabouraud.—p. 105.
*Syphilis of the Nervous System. J. A. Sicard.—p. 111.
*Jaundice and Arsphenamin. G. Milian.—p. 113.
*Arsphenamin Erythrodermia. L. Brin.—p. 117.
*Pathogenesis of Neurorecurrence, etc. H. Gougerot.—p. 119.
*Elimination of Arsphenamins. M. Pomaret.—p. 123.
*Early Diagnosis of Syphilis. L. Spillmann.—p. 126.
*Abortion of Syphilis. Lévy-Bing and Gerbay.—p. 130.
*Treatment During Incubation of Syphilis. A. Tzanck.—p. 132.
"Epidemics" of Toxic Action from Arsenicals. A. Lévy-Franckel.—p. 135.
*Neo-Arsphenamin by the Vein for Syphilitic Infants. G. Blechmann.—p. 137.
Technics for Bordet-Wassermann Reaction. A. D. Ronchèse.—p. 141.
Bordet-Wassermann Reaction in Spinal Fluid. M. Binet.—p. 143.
Cold in Treatment of Erythematous Lupus. M. Vignal.—p. 147.

Dermatology and Syphilis in 1920.—In the course of this long review Gougerot remarks that there seems to be increasing agreement as to the wisdom of large progressive doses in primary syphilis. Milian gives from 0.3 to 0.9 gm. or even 1.2 of neo-arsphenamin in the primary phase. Leredde in the second and third phases begins with small doses, 0.1, increasing to 0.9. With syphilitic disease in the nervous system, kidneys or aorta, the doses recommended are between 0.1 and 0.3. The advantage of associating mercury with the arsenicals is admitted more and more. "The arsenical attacks, but the mercury brings up the reenforcements to hold what has been gained." As to mishaps with the arsphenamins, Gougerot thinks that damage of the organ by the drug and damage by the syphilis both cooperate. Abadie declares that in rebellious cases treatment should be kept up with mercuric cyanid by the vein every second day, from 0.01 to 0.02 gm., for one, two or three years if necessary, and reports success beyond all hopes in certain cases by this means. Gougerot presents the arguments for and against there being more than one type of spirochete, inclining to the negative view himself. He mentions parenthetically a special calendar he gives to his syphilitic patients.

Technic for Treating Syphilis.—Queyrat and Pinard laud the method of attacking syphilis at its beginning by striking hard, in six day doses, beginning with 0.15 gm. of arsphenamin and reaching 0.6 by the eighth injection.

The Teeth in Inherited Syphilis.—Sabouraud cautions against overlooking malformations of the teeth as they may seem normal on casual inspection unless they are counted, and the jaw examined. These signs of the inherited taint are particularly instructive as they are permanent.

Treatment of Neurosyphilis.—Sicard reiterates the great value of small, repeated doses of neo-arsphenamin and iodid, kept up every day or second day by both the subcutaneous and the intravenous route. The family can be trained to do this. Five of his patients with typical general paresis have resumed their place in the family if not in business, and the improvement has persisted for three years. Three times a year each is given a course of small repeated doses to a total of from 7 to 10 gm. Some have taken up to 70 gm. of neo-arsphenamin during the three years. His opinion of intraspinal injection is that it is deluding, and does not deserve the praise given it in America and in Spain, while experience has convinced him of its dangers.

Jaundice and the Arsenicals.—Milian says that he at first believed the jaundice was the work of the arsenicals but three years of study have convinced him of his error, and he now declares that the syphilis itself is responsible for it, as also for the ocular, facial or other paralysis sometimes noted. These phenomena are observed only by those giving too timid doses; thirty such cases have been sent him in the last eighteen months, and in every instance the dosage had been too weak or the technic defective. All were treated vigorously with the arsenicals and the cure was soon complete; if the drug were responsible, it would be an unheard of thing to cure a manifestation of poison by giving more of the poison.

Arsphenamin Erythrodermia.—Brin mentions that the extensive and desquamating erythrodermia appeared after from seven to twenty injections of neo-arsphenamin. In such cases there had usually been up to 5 or 10 gm. injected during the current course of treatment. The drug should be stopped at once, nothing but milk allowed for a few days, and then a milk-vegetable diet, rinsing out the intestines thoroughly with boiled water. All active local treatment should be avoided.

Pathogenesis of Neurorecurrence.—Gougerot explains the neurorecurrences and the symptoms developing in viscera, after arsenical treatment, as a combination of toxic manifestations and flaring up of the syphilis. The syphilis has become modified by the treatment until it is tertiarized, the lesions assuming the destructive character of the spontaneous tertiary phase. If the toxic element predominates, further arsenical treatment can do only harm, but if the visceral lesions outshadow them, then further arsenical treatment will usually cure.

Elimination of the Arsenicals.—Pomaret's research has confirmed that more of the arsphenamin is eliminated by the intestines than by the kidney after intravenous injection. The bile from a dog with a bile fistula showed constantly more than 1 cg. in 5 c.c. of bile, while 15 c.c. of the urine contained only fractions of a milligram. As the amount of bile secreted in the twenty-four hours is about equal to that of the urine, the importance of this mode of elimination is obvious. Similar experiments on a rabbit gave analogous findings. Jeanselme has published a case in which 1 cg. of arsenic was found in the vomit from five to eight hours after injection of 0.6 gm. of arsphenamin. We know also that the hair, the skin, etc., retain arsenic in considerable amounts. Elimination seems to be slower after intramuscular injection. Simultaneous mercurial treatment retards elimination somewhat.

The Pharmacist and Syphilis.—Spillmann extols the important aid which the pharmacist can render in the organized fight against syphilis by warning the customer to seek a proper diagnosis at once. He cites the resolution recently adopted by the Nancy Medical Society urging pharmacists consulted by persons with genital lesions to impress on them the extreme urgency of their being examined by a physician before selling them remedies which may waste precious time.

Conditions for Abortive Treatment of Syphilis.—Lévy-Bing and Gerbay discovered that the Bordet-Wassermann reaction appeared always after a certain interval from the hour of contagion. If abortive treatment is pushed before this date it has every prospect for success, but after this date, treatment may retard the appearance of the positive reaction but does not prevent its becoming positive sooner or later. This interval is thirty-seven days long, counting from the hour of infection. Then comes a period of eight days during which the outcome is dubious, but after the forty-fifth day no treatment will ward off a positive reaction. Hence, they conclude, abortive treatment cannot be counted on to be effectual after the thirty-seventh day.

Syphilis Should Be Treated During the Incubation.—Tzanck insists that the spirochete should be the call to arms; we must not wait for a positive Wassermann reaction.

The Syphilitic Newly Born.—Blechmann points to the mounting tide of infants with inherited syphilis, and the greater recognition of the ever widening sphere of its evil influence. We must attack it at once and strike hard, profiting by the efficacy of the arsenicals in addition to mercury. He begins with less than a centigram per kilogram, increasing to 0.015 or 0.02 gm. every sixth or seventh day, by the vein, in series of from five to ten injections, with suspensions for a month or two.

Paris Médical, Paris

Nov. 20, 1920, 10, No. 47

*Acute Poisoning from Nitrous Fumes. F. Jacoulet.—p. 369.
*Fulminating Deafness in Inherited Syphilis. G. Portmann.—p. 374.
Case of Trophic Disturbance in Hysteria. E. Macrà.—p. 378.
Intentional Tremor from Picric Poisoning. E. Charpin.—p. 379.

Nov. 27, 1920, 10, No. 48

General Conception of Lichen Planus. G. Thibierge.—p. 385.
Grouping of Atoms in Epinephrin. M. Tiffeneau.—p. 390.
Kineplastic Operations on Amputation Stumps. C. Roederer.—p. 394.

Acute Industrial Nitrous Poisoning.—The plumber had been repairing a ventilator opening into the "lead rooms" of a chemical fertilizer factory, and was exposed to the nitrous fumes for several minutes. He felt a general malaise during the afternoon, and at night developed a distressing spasmodic cough. By the next morning the dyspnea was extreme, all the symptoms suggesting suffocating capillary bronchitis. Wet cups were applied and spartein and camphorated oil injected without relief. Venesection improved conditions a little but the condition grew progressively worse, with subcoma, progressive asphyxia and asystoly, the condition desperate by the thirty-sixth hour. Then subcutaneous injection of oxygen through a serum needle induced slight progressive improvement. In forty-eight hours more than 80 liters of oxygen were thus injected, forming an emphysema over the entire body to the base of the chest, and the man rapidly recovered. In Pic and Durand's case the man was in complete coma but recovered after subcutaneous injection of 180 liters of oxygen the first day, to a total of 230 liters in forty-eight hours. The diffusion and absorption of the oxygen are promoted by light massage; the absorption proceeds the more rapidly the more avid the tissues for oxygen. Jacoulet knows of only four attempts to inject oxygen by the vein, and urges that for the present it is better to keep to the subcutaneous route. This has proved its harmlessness, and these cases demonstrate its efficacy.

Fulminating Deafness in Inherited Syphilis.—Portmann analyzes the mechanism of the vascular lesion presumably responsible for the sudden deafness, blocking the conduction of the auditory impulse.

Presse Médicale, Paris

Nov. 20, 1920, 28, No. 85

*Devices to Correct Incontinence. L. Ombrédanne.—p. 833.
*Blood Germ Carriers. E. Escomel (Lima).—p. 835.
*Serodiagnosis of Syphilis. P. L. Marie.—p. 836.

Correction of Urinary Incontinence.—Ombrédanne's method consists in the wearing of a light metal brace to compress the meatus and thus insure continence. Unscrewing the brace opens the meatus and allows practically normal micturition. In order to insure the correct functioning of the metal brace it has to be fastened solidly to the skin, and for this he utilized a horizontal, kineplastic skin-lined tunnel through the aponeurosis of the rectus muscles, well above the pubis, with a corresponding parallel tunnel just below the base of the penis. The tunnel found most convenient and durable was made with a flap of skin cut beyond one side of the site of the proposed tunnel. This flap was sutured to make a tube close up to its pedunculated end, adjacent to the site of the tunnel. Then it was turned back over on itself and drawn through the tunnel for which it provided a lining tube its entire length. The folding over does not seem to impair its vitality. He gives an illustrated description of the successful outcome in a boy with incontinence after correction of epispadias and a girl with incontinence entailed by spina bifida. The girl's brace fits into a single perpendicular tunnel, and closes the meatus with a pad. The whole is removed at night. Ombrédanne thinks that this combination of tunnels and mechanical devices may prove useful to close incontinent gastrostomies, artificial anus, etc.

To Detect Carriers of Micro-Organisms in the Blood.—Escomel's warning in regard to possible latent parasitism of the blood was recently cited in these columns, Dec. 4, 1920, p. 1601. He here describes a simple method for detection of this hemoparasitism, as he calls it. He mixes with the blood a 1 per cent. solution of acetic acid to destroy the erythrocytes; centrifuges, and then applies the usual stains to the sediment. When the erythrolysis is not complete with 10 or 15 c.c. of the solution, he mixes the sediment with another 15 c.c. The parasites and leukocytes are collected into very small compass, and by this simple means examination repeated every day under identical conditions allows two curves to be charted, one of the parasites and one of the leukocytes, which permit deep insight into the course of the disease. It should always, he declares, be an indispensable preliminary to a major operation as much as examination of the urine for sugar.

Serodiagnosis of Syphilis.—Marie passes in review the various methods for serodiagnosis of syphilis proposed in recent years, adding that Vernes' researches have demonstrated the general nature of the phenomenon of the flaking of suspensions of colloids under the influence of serums, syphilitic or not. But syphilitic serum induces it a little faster than normal serum. It is merely a question of degree in a general physical-chemical phenomenon. This flaking is not pronounced enough to be visible, but it becomes visible indirectly by the inhibition of hemolysis which it entails. Vernes' latest reaction is based on the superflaking properties of syphilitic serums as estimated with a standard opalescence scale. Marie remarks in conclusion that it is scarcely probable that syphilis is the only disease that induces physical-chemical changes in the serum, and evidence is accumulating that the serum in tuberculosis and cancer may have a special action on suspensions of colloids.

Nov. 24, 1920, 28, No. 86

Heart Sounds in Partial Heart Block. Laubry and Esmein.—p. 845.
Results of War Fractures. Rottenstein and Courboules.—p. 846.

Nov. 27, 1920, 28, No. 87

Inaugural Lecture on Obstetrics. Brindeau.—p. 853.
*Continent Gastrostomy. C. Souligoux and R. Bloch.—p. 857.
*Treatment of Poisoning. L. Cheinisse.—p. 858.

Dec. 1, 1920, 28, No. 88

Clinical Importance of Electrocardiography. H. Vaquez and E. Donzelot.—p. 865.
Improbability of Contusion of Hip Joint. A. Basset.—p. 867.

A Continent Gastrostomy.—Souligoux and Bloch assert that the technic of which they give an illustrated description insures an absolutely continent opening. The patient can cough and strain with his stomach full and yet not a drop escapes. In the cadaver, the stomach can be distended to bursting and yet the fistula will not leak when made by this method of torsion plus invagination. The stomach wall is lifted up, about 5 cm. high, with three forceps, and the tip of the cone thus formed is twisted exactly one quarter around, the forceps bunched vertically. The walls of the cone thus fall into two or three spiral folds, and these folds are held in place with a few interrupted silk sutures not reaching to the mucosa. A suture thread is then passed entirely through the wall of the cone at the opening in the tip, and this thread is then passed through the serosa and muscle of the wall of the cone at its base. Four such interrupted stitches are taken around the edge of the opening in the tip of the former cone, each including a fold at the base of the cone, and each is drawn up and tied. The whole intermediate part of the wall thus loops down inside, and this loose invaginated crown of wall tissue forms a most efficient valve to prevent egress of the contents of the stomach while not impeding in the least the entrance into the stomach.

Treatment of Poisoning.—Cheinisse comments on the progress realized recently in the treatment of poisoning. The old habit of giving an emetic has been abandoned for lavage of the stomach which may prove useful even after six to twelve hours, with certain poisons. As some poisons are liable to stick to the wall of the stomach, the rinsing process must be thorough, using from ½ to ¾ liter of water each time, and repeating till the stomach has thus been flushed with about 20 liters. This should be followed with animal charcoal to insure the absorption of the poison left in the body. This takes the place of the old antidotes, although there is nothing to hinder any of the usual antidotes being added to the water for the rinsing procedure. Adler published at Prag in 1912 7 cases of phosphorus poisoning, 3 of morphin and others of poisoning with mercuric chlorid, arsenic, absinthe, etc., a

total of 30 cases in 22 of which the outcome would most certainly have been fatal without this absorbent action. Klemperer advocates in every case of poisoning of not more than two hours' duration to begin with the lavage and then introduce into the stomach two tablespoons of finely pulverized animal charcoal, combined with 30 gm. of magnesium sulphate. If too late for the lavage, he gives this mixture at once in ½ liter of water by ingestion or through a tube. Klemperer advises to give a saline purge at the same time, but Cheinisse recalls Lubenetzky's statements that castor oil is a better purge under these conditions, as the accumulation of fluid in the bowel is liable to prove injurious. Be this as it may, Klemperer up to October, 1920, had a record of 25 grave cases of poisoning with mercuric chlorid, arsenic, lysol, phosphorus and cyanid of potassium, without a single fatality, under this treatment. The heart should be supervised, but the charcoal is the only antidote to rely on. In conclusion Cheinisse reiterates that the charcoal is liable to prove as effectual against autogenous toxins as against the exogenous, especially in enteritis, diarrhea, etc.; from 20 to 30 gm. of the charcoal may ward off serious injury. Cheinisse adds that the above does not refer to corroding acids or alkalis; these of course require neutralizing with magnesia or with dilute acetic or citric acid.

Revue Médicale de la Suisse Romande, Geneva

October, 1920, **40**, No. 10

Acute Epidemic Encephalitis. F. Bauer and J. Mayor.—p. 645.
*Roentgen-Ray Treatment of Epilepsy. E. Kummer.—p. 662.
Transfusion of Blood. H. Curchod.—p. 666.
*Splenopneumonia. R. Reymond.—p. 675.
Retroperitoneal Tumors. H. Vulliet.—p. 682.
*Fulminating Streptococcus Purpura. Reh.—p. 690.
Cancer of Stomach Invading Abdominal Wall; Gastrectomy and Recovery. C. Perrier.—p. 694.

Radiotherapy in Epilepsy.—Kummer cites data from the records which show that the action of the roentgen rays in epilepsy is neither regular nor constant, benefit in some cases being balanced by negative or frankly bad results in others. He reports a personal case of traumatic epilepsy in a man inclined to abuse of alcohol. The extremely severe seizures had returned about once in two weeks for nine months when Kummer applied radiotherapy, a total of 90 X roentgen units in two series during two months. There were no seizures during the following nine months. Then three new seizures occurred, and another series of roentgen exposures was given to a total of 40 X units. There has been no recurrence since then during the three months to date of writing. After each exposure the man fell into a deep sleep for ten minutes, but then roused and felt well. Bromid is given regularly daily.

Splenopneumonia. — Reymond concludes from a case described and compared with what others have written, that Grancher's disease is merely a purulent pleurisy in which the pus has become encysted deep in the tissues. Study of an interlobar pleurisy accessible to puncture shows the analogy. The punctures should be repeated at different levels of the interlobe, and especially before defervescence.

Fulminating Purpura. — Reh recently reported a case of fulminating streptococcus purpura in a newborn infant, fatal at the sixtieth hour. He here reports a similar case in a girl of 6, with death in twelve hours. The child had recovered three weeks before from a mild attack of enteritis.

Schweizerische medizinische Wochenschrift, Basel

Oct. 28, 1920, **50**, No. 44

Care of the Prematurely Born. O. Hürzeler.—p. 985.
Cholesteatoma with Tuberculous Otitis Media. E. Oppikofer.—p. 993.
Biochemical Treatment of Pulmonary Tuberculosis. E. Zuelin (Cincinnati).—p. 994.
Device for Recording Movements of Isolated Frog Heart. C. Ansler.—p. 997.
Focal Injections of Silver Preparation. H. Koller.—p. 998.

Annali d'Igiene, Rome

May, 1920, **30**, No. 5

Use of Ultraviolet Rays in Making Vaccines. R. Lanrillotta.—p. 245.
Combination of Mineral Salts with Organic Colloids in Certain Vegetables. A. Scala.—p. 251.
Cultivation of Anaerobes. G. Cianl.—p. 274.
Typhus. A. Ilvento.—p. 280. Cont'n.

Pediatria, Naples

Oct. 15, 1920, **28**, No. 20

The Opsonic Index in Relation to the Specificity of Vaccines. I. Nasso.—p. 937.
Importance of the Intradermal Tuberculin Test in Infants and Young Children. G. Salvetti.—p. 941.
*Idiopathic Osteopsathyrosis. E. Ruggeri.—p. 953.

Idiopathic Osteopsathyrosis.—The history and literature of this subject are compared with the roentgen rays and metabolic findings in a pronounced case in a girl of 13, who had a history of twelve fractures. The daily high deficit in the phosphorus, calcium and magnesium balance was much reduced under treatment with thymus and suprarenal extract, and there was great general improvement for a time after the nearly three months course, but gradually the condition returned to statu quo. Even the few months of marked improvement under the organotherapy throw light on the pathogenesis. There was nothing to suggest syphilis in the family, or tuberculosis, and no hereditary influence could be discovered. The child was born with this extreme fragility of the bones as well as hypoplasia of the cardiovascular and muscular systems. The whole suggests embryonal defective development of the mesoderm.

Policlinico, Rome

Nov. 1, 1920, **27**, No. 44

*Acute Necrosis of Pancreas. G. Moccia.—p. 1235.
Bilateral Peri-Anal Abscesses. E. Pirondini.—p. 1241.
*Reflex Anuria from Calculus. A. Sala.—p. 1242.

Acute Necrosis of the Pancreas.—The woman of 40 had been having diffuse abdominal pain with occasional vomiting for a month, with periods of relative calm with diarrhea but no fever or jaundice. Then came intense pain in the right hypochondrium, spreading to the entire abdomen, with continuous vomiting, hiccup, extreme meteorism, the abdomen tender throughout, and other signs of acute occlusion of the bowel, with anuria, stercoremia and collapse. Nothing was found in the bowel to explain the ileus, and the woman died twenty hours after the laparotomy. The pancreas was only slightly larger than usual but the hemorrhagic necrosis explained the clinical picture. The case emphasizes the difficulty of differentiating acute necrosis of the pancreas in certain cases.

Reflex Anuria.—In Sala's case the reflex had been elicited by a small calculus in the ureter which did not block it completely. The symptoms had indicated a calculus in the kidney, but exposure of the single kidney failed to reveal the calculus which was found at necropsy in the ureter close to the entirely empty bladder.

Nov. 8, 1920, **27**, No. 45

Skin Tuberculin Reaction in a Thousand Public Hospital Patients. Anna Zanon.—p. 1267.
Epidemics of Grain Itch. L. Puntoni.—p. 1273. Idem. P. Pantaleoni.—p. 1275. Summarized Dec. 11, p. 1656.
Square Frame for Fractured Humerus. G. Spelta.—p. 1276.
Etiology and Pathogenesis of Tuberculous Skin Disease. P. Rusca.—p. 1278.

November, 1920, **27**, Medical Section No. 11

*Biologic Tests for Echinococcus Disease. F. Pontano.—p. 405.
*Paroxysmal Hemoglobinuria. L. Datta.—p. 422.
Vaccine Therapy by Spray in the Air Passages. A. Gasbarrini.—p. 435.
*Urine as Vitamin. F. Curatolo.—p. 439.

Biologic Tests for Echinococcus Disease.—Pontano reviews what has been done in this line, and reports extensive clinical and experimental research which has demonstrated that Casoni's method of intradermal injection in man of fluid from a hydatid cyst in an animal is a very sensitive and reliable test. It proved positive in 84 per cent. of Pontano's experiences while the subcutaneous reaction was positive only in 66; the Ghedini-Weinberg fixation of complement test in only 50 per cent., and there was characteristic eosinophilia in only 40 per cent. The fixation of complement test is strictly specific but it does not occur when there is suppuration in the cyst. The fluid from a hydatid cyst is an antigen, capable of sensitizing normal persons. The amount necessary for the intradermal test reaction is from 0.2 to 0.3 c.c. while 1 c.c. is necessary to elicit a subcutaneous reaction. Suppuration in the cyst is responsible for the negative reactions sometimes obtained.

Paroxysmal Hemoglobinuria from Chilling.—Datta describes three typical and severe cases which confirm the connection between this pathologic condition and syphilis; under treatment as for syphilis all were cured. The patients were two men of 34 and 49 and a woman of 24, and the Wassermann reaction was positive in all. The cure has persisted for years to date in the two men. The woman succumbed to an intercurrent pneumonia, but nothing was found at necropsy to throw light on the hemoglobinuria. Each of the patients continued to present abnormal urobilinuria at times, and Datta is inclined to regard this as a kind of abortive attack.

Substances in Urine Which Act Like Vitamins.—Curatolo has confirmed Gaglio's assertions in regard to the protecting action of urine against deficiency disease in pigeons. Pigeons fed with 20 gm. of polished rice do not develop polyneuritis when 5 c.c. of rabbit urine is given with it, while others developing the deficiency disease from lack of vitamins regain their normal health under systematic administration of 5 c.c. of the natural urine from rabbits. Gaglio's experiments were made with human urine. The rabbit urine seemed to be equally effectual against the spastic and the paralytic forms of polyneuritis in the pigeons. The vitamins Funk extracted from beer yeast displayed a curative action only in the acute, the spastic form, and recurrence a few days later was the rule. Curatolo evaporated the rabbit urine and found that the inorganic mixture of salts resulting had absolutely no action as a vitamin. This must be restricted to the nitrogenous waste in the urine.

Riforma Medica, Naples

Sept. 25, 1920, **36**, No. 39

Bladder Diverticulum in Inguinal Hernia. B. Rosati.—p. 878.
Gastro-Enterostomy for Cicatricial Stenosis of Pylorus. A. Ajello.—p. 880.
Drug Treatment for Vascular Spasm. A. Ferrannini.—p. 885.
Diet to Promote Growth. A. Jappelli.—p. 887.

Oct. 2, 1920, **36**, No. 40

The Scientific Dignity of Special Pathology. G. Viola.—p. 901.
*Precipitin Test for Tuberculosis. L. Ferro.—p. 907.
*Fixation of Complement in Dementia Praecox. P. Magaudda.—p. 908.
*Treatment of Malaria. T. Silvestri.—p. 909.
Operative Treatment of Cholecystitis. V. Pauchet.—p. 911.

Thermoprecipitation in the Diagnosis of Tuberculosis.—Ferro refers to the ring of precipitation which forms at the line of contact between a chloroform autolysate of tuberculous sputum and the serum from a horse hyperimmunized against tuberculosis. Diagnostic import has been ascribed to this by A. Ascoli and others, but Ferro's tests with over 100 specimens of sputum showed that this reaction occurred indiscriminately in varying proportions in the healthy as well as in the tuberculous.

Complement Fixation in Dementia Praecox.—Magaudda relates that extracts of the testicles, thyroid and pituitary of eight dementia praecox cadavers were applied to test for hemolysis the serum from twenty patients with dementia praecox. His table shows complete hemolysis in all with the pituitary extract from each of the eight cadavers with the exception of one negative response to one of the eight extracts. Each of the extracts from two of the cadavers (paranoid dementia) induced constantly positive reactions. All the pituitary extracts were constantly positive.

Treatment of Malaria.—Silvestri comments on the enormous spread of malaria in Italy during and since the war, and urges the combination of other measures with quinin treatment, especially suprarenal extract, protein therapy, serotherapy, strychnin, etc. He endorses in particular a daily dose of 2 or 3 mg. of strychnin as useful and simple. By changing the mode of administration of the quinin, sometimes better results are obtained. Without insisting on laboratory examination, he has his old malaria patients after apparent cure take a new, shorter course of treatment spring and fall. He adds that it might be well to give Viale's photodynamic method a trial, that is, to expose the trunk, nude, to the sunlight after taking the dose of quinin. Even if it does not enhance the action of the quinin, as anticipated, it might benefit in other ways. He also cites authorities who corroborate the advantages of Pais' method of mild roentgen irradiation of the spleen. The public health authorities in Italy sanction this, and others assert that it rouses the defensive forces like a trip to the mountains. M. Ascoli, Fagiuoli, Stephan, Fraenkel, Stettner and Klewitz have recently reported experiences showing the stimulating action of very mild irradiation of the glands with an internal secretion, the spleen in particular.

Brazil-Medico, Rio de Janeiro

Oct. 2, 1920, **34**, No. 40

Nephrectomy for Hydronephrotic Sagging Kidney; Recovery. Z. do Amaral.—p. 651.
*Syphilitic Meningitis. O. Clark.—p. 652.
*Testing for Urobilin. Cunha Lopes, Jr.—p. 654.

Syphilitic Meningitis.—Clark's patient presented the complete clinical picture of cerebrospinal meningitis, but the lumbar puncture fluid was almost pure blood at three punctures. There had been no trauma, but serologic tests were positive, and under treatment as for syphilis complete recovery promptly followed. Six weeks after the first symptoms the spinal fluid was normal. Extreme ophthalmoplegia was one of the early symptoms.

Improved Test for Urobilin in Urine.—Cunha Lopes describes a simple method which renders fluorescence tests much more sensitive and reliable, according to his account.

Oct. 9, 1920, **34**, No. 41

*Surgical Treatment of Glaucoma. G. de Andrade.—p. 669.
*Acute Syphilis of the Lung. Ary Miranda.—p. 675.

Surgical Treatment of Glaucoma.—De Andrade is convinced that the few instances in which irridectomy has failed to cure glaucoma have been due to lack of skill in the operator or to the insubordination of the patient. If the hypertension returns anew, sclerotomy is indicated, and he cites a case in which sclerotomy was repeated as occasion arose twenty times, saving the eyesight. In another case sclerotomy was done four times in Rio after it had been done three times in Paris and twice in Bahia, saving vision, which certainly would have been lost without this repeated intervention. He warns expressly against the use of miotics at the operation as they predispose to iritis.

Pulmonary Syphilis.—Nothing but the absence of tubercle bacilli in the sputum contradicted the assumption of an acute tuberculous process in the left lung of the man of 19 with rapid destruction of tissue, extreme weakness, sweats, dyspnea and profuse expectoration. There was no history of acquired syphilis, but inherited syphilis could not be absolutely excluded, and under treatment for syphilis clinical recovery promptly followed. The Wassermann test had been constantly negative but veered transiently to positive during the course of treatment.

Tohoku Journal of Experimental Medicine, Sendai

Sept. 13, 1920, **1**, No. 3-4. German and English Edition

*Physiologic Action of Typhoid Toxin. J. Sogen.—p. 212.
*Action of Pneumococcus Toxin on Circulation. J. Sogen.—p. 287.
*Action of Bacterial Toxins on Intestine. J. Sogen.—p. 339.
*Studies in the Gastric Juice. I. M. Takata.—p. 354.

Physiologic Actions of Typhoid Toxin.—Sogen's exhaustive study of this subject from the clinical and experimental standpoints is an attempt to explain the relative slowness of the pulse with the high fever characteristic of typhoid.

Influence of Pneumococcus Toxin on the Circulation.—In a similar study of pneumotoxin, he found evidence that the disturbance in the circulation was not due entirely to peripheral vasomotor paralysis but rather to primary toxic injury of the heart.

Influence of Bacterial Toxins on the Intestine.—Sogen announces further that the pendulum movement of the surviving intestine is affected differently by different bacterial toxins, as he describes in detail.

Chlorids in Body and Secretion of Gastric Juice.—The results of Takata's experiments on a dog with a Pawlow fistula contradict some of the prevailing views in regard to the secretion of hydrochloric acid as dependent on the chlorin content of the body fluids.

Jahrbuch für Kinderheilkunde, Berlin

1920, **92**, No. 5

*Diphtheria in Young Infants. Elise Hermann.—p. 273.
*Deep Roentgen-Ray Treatment for Children. P. Karger.—p. 295.
*Complications of Sinusitis in Children. M. Paunz.—p. 313.

Intubation for Diphtheria in Infants.—Hermann remarks that feeding the infant through a tube in the nose permits intubation even for the youngest. Her statistics show that pneumonia is scarcely any more frequent after this than after tracheotomy. Local ulceration was found in 50 per cent. of the 12 infant cadavers less than a year old but only in 14.28 per cent. of 28 between the ages of 1 and 2, the average thus being only 25 per cent. for these two years while the average was 36.36 per cent. of the 33 children 3 and 4 years old. Tracheotomy gives no better results in regard to complications. Her article is based on ten years' experience at the Leipzig children's clinic. Diphtheria in very young infants is more likely to be restricted to the nose than in older children. During the first years of the war the interns were constantly changing, and the lack of experience of the newcomers was reflected in the higher death rate in the intubated younger children.

Deep Roentgen-Ray Treatment of Children.—Karger has applied this technic in 100 cases, mainly tuberculous lymphomas. The majority subsided in from two weeks to three months, that is, under one or two exposures. Only a few were given a longer course, but one child was finally cured after a year of treatment. No permanent injury was observed in any instance but other tuberculous lesions in the vicinity sometimes flared up. The lymphomatous tumors in pseudoleukemia melted away under the exposures but the effect was merely cosmetic, as the children all died. No benefit was observed with inoperable malignant tumors except that the pain was materially reduced. The skin of the abdomen seems more sensitive than the neck in children. Some children displayed a general reaction with fever, headache, and vomiting, beginning from half an hour to six hours after the exposure, and lasting from half an hour to several days. Those affected were almost always older children, with a neuropathic predisposition. The roentgenotherapy seems to hasten the regression of lesions with a tendency to a spontaneous cure and it can be regarded as a useful adjuvant but too much must not be expected of it.

Complications of Sinusitis in Children.—Paunz comments on the frequent discovery in child cadavers of inflammatory and suppurative processes in the sinuses communicating with the nose. In older children an acute infectious disease is generally responsible for the sinusitis, but in infants even coryza or tonsillitis may develop this complication; cases are known in infants only a few weeks old. Schlemmer has encountered 5 cases of the kind in children and has compiled 52 similar ones from the literature, including 24 for which scarlet fever was responsible. Paunz gives the details of 12 cases from his own service, including one with a fronto-ethmoidal mucocele which had developed slowly without subjective symptoms. He has had a number of such cases in adults; the optic nerve never showed injury although in some of the cases the eyeball protruded. Acute inflammation in such a mucocele might do serious damage, and hence operative treatment is called for at once when first diagnosed. In 3 children the frontal and ethmoid sinusitis was a complication of typhoid, diphtheria or measles; in 2 others of scarlet fever, and in one child there was a tuberculous process in the frontal bone. In the 6 others, the sinusitis had followed coryza, including one 6 weeks' infant.

Zeitschrift für Tuberkulose, Leipzig

September, 1920, **32**, No. 6

*The Silicic Acid Problem in Tuberculosis. A. Kühn.—p. 321.
Pathologic Anatomy of Progressive Tuberculosis. H. Beitzke.—p. 329.
Morphology of the Sputum in Pulmonary Tuberculosis. E. Liebmann.—p. 341.
*The Urine Test for Tuberculosis. R. Offenbacher.—p. 355.

Silicic Acid in Tuberculosis.—Kühn emphasizes that not enough attention has been paid hitherto to silica which forms such a large proportion of fibrin, the main factor in the healing of a tuberculous process in the lung. Human hair contains from 2.61 to 29.3 per cent. silica, according to Gonnermann's table; the suprarenals from 7.44 to 16, and fibrin from 16.28 to 30 per cent. Kühn succeeded in rendering guinea-pigs immune to tuberculosis by injection of colloidal silicic acid, and 400 tuberculous persons under his directions have been taking for four years a silica tea, that is, a decoction of certain herbs which Gonnermann found contained from 43 to 272 mg. of silicic acid in the three cupfuls which formed the daily dose. The herbs are *Herba equisiti min.; Herba polygon.* and *Herba galeopsidis.* The number of cases in which great improvement is evident is too large to be attributed to chance. He mentions parenthetically that the disease seemed to be most dangerous and hardest to influence in the young, and he queries whether the lesser silica content of certain organs in the young may not have some influence in this respect. In some cases he gave the silicic acid in colloidal form by intramuscular injection.

The Urine Test for Active Tuberculosis.—Offenbacher relates that of twenty persons with active tuberculosis, only three gave an unmistakably positive response to the Wildbolz auto-urine test. In some of the cases the response was negative when the Mantoux intradermal tuberculin test was positive. The urine has to be evaporated to one tenth, the heat not allowed to surpass 60 C.

Zeitschrift für urologische Chirurgie, Berlin

Nov. 6, 1920, **8**, No. 3

Diverticulum in the Bladder; Three Cases. Bischoff.—p. 123.
*Diagnosis of Hypertrophy of the Prostate. O. Zuckerkandl.—p. 135.
*Physiology and Pathology of Micturition. H. G. Pleschner.—p. 148.

Diagnosis of Hypertrophy of the Prostate.—Zuckerkandl gives thirteen illustrations to show the changes in the roentgen ray and other findings when the prostate becomes enlarged. The most striking change is perhaps that in the outline of the contrast fluid injected. In normal conditions the outline is something like a triangle, the small end down, while with hypertrophied prostate the broad end of the triangle is down and the smaller end on top. He illustrates further the cystoscopic findings characteristic of the anatomic changes which develop with enlargement of the prostate, especially at the trigonum and ureter mouths. Cancerous degeneration occurs in about 10 per cent. of the cases of hypertrophied prostate, but it is impossible to differentiate this until it reaches an advanced stage. When the prostate shrivels into cicatricial tissue, the symptoms of retention and complicating infectious processes are particularly pronounced, but differentiation may be difficult. The long duration, the febrile periods, and the hardness of the shriveled gland are suggestive.

The Physiology and Pathology of Micturition.—This forty page communication with extensive bibliography introduces an alleged new muscular element into the micturition process. It is a longitudinal muscle in the urethra which in normal conditions holds the posterior urethra open during micturition. When it is injured by hypertrophy or atrophy of the prostate, it ceases to accomplish its physiologic purpose, and this entails the disturbances in urination which accompany these prostate anomalies.

Zentralblatt für Gewerbehygiene, etc., Berlin

November, 1920, **8**, No. 11. Only medical articles listed.

*Asthma in Fur Dye-Workers. C. Gerdon.—p. 201. Conc'n.

Asthma in Fur Dye Workers.—The dyes to which Gerdon refers are of the ursol class, made from p-phenyldiamin which has been used also in hair dyes. Criegern in 40 cases of illness from preparations of p-phenyldiamin observed asthma, besides eczema and irritation of the air passages, and noted that the asthma recurred at the mere odor of the dye. Gerdon's experience confirms this sensitization to the dye, his 7 cases of occupational asthma from this cause confirming the assumption of an anaphylaxis instead of a primary intoxication. There was salivation in 3 of the 7 cases, edema in 3, diarrhea in 2 and exophthalmos in 2 others, with coryza in all. A supplementary direct toxic action from the chemical on the air passages may induce a local region of lesser resistance. The 6 men and 1 woman displayed no signs of a neuropathic

or exudative predisposition. They had been employed at this work for three months to ten years. The asthma does not develop until from half an hour to twenty-four hours after inhaling the dust containing the chemical. On changing to another occupation they had no further attacks of asthma but it returned on resuming this work; in one case after an interval of seven years. Those who have abandoned the work occasionally have to handle ursol-dyed furs from another city, and some of them each time develop an attack of asthma. In addition to these occupational cases he reports the case of a young woman, who had been assisting him in his chemical experiments. She was taken suddenly in a theater with nausea, a "hideous taste in the mouth," and incessant dry coughing, which kept up for two hours. The nausea persisted for two weeks, at which time there was eosinophilia of 7 per cent. She was wearing a fur tippet at the time, and Gerdon suggests that wearing a recently ursol-dyed fur might sensitize so that later contact with a new ursol pelt or the smell from it might bring on an attack of asthma. It might be well to investigate this when consulted for asthma. Gerdon's experimental research thus has confirmed that anaphylaxis can be induced with certain p-phenyldiamin derivatives, and suggests the prophylactic use of calcium for those engaged in dyeing pelts. Ursol dust is almost tasteless and odorless to normal persons.

Mededeel. v. d. Burg. Geneesk. Dienst, Java

1919, No. 10. Parallel Dutch-English Edition

*Anophelines in Connection with Occurrence of Malaria. N. H. Swellengrebel and J. M. H. S. de Graaf.—p. 1.
*Parasitic Haplosporidium Found in Anophelinae. Id.—p. 68.
Malaria in Modjowarno. Id.—p. 73.
*Malaria and Anophelines at Samarang. Id.—p. 113.

Mosquitoes and Occurrence of Malaria in Java and Sumatra.—The various articles are illustrated. They describe extensive research on the anophelines of different parts of the Netherlands Indies.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

Oct. 23, 1920, **2**, No. 17

*Genital Tuberculosis in Women. L. F. Driessen.—p. 1652.
*Poisoning from Cheese. B. Hylkema.—p. 1662.
Roentgen-Ray Treatment of Tuberculous Glands. S. Keyser.—p. 1667.
Coagulen Internally and the Temperature. W. Jost.—p. 1673.
Rapid Osteomyelitis After Influenza. A. Verschoor.—p. 1676.

Genital Tuberculosis.—Driessen says that in investigating the outcome in his cases of genital tuberculosis in women, he has been surprised to find the women in excellent health ten years or more after operative treatment of afebrile genital tuberculosis, and even without operative intervention. But when there were fever and night sweats, the outcome was usually fatal. However, recent favorable experiences with roentgen rays and ultraviolet rays in such cases justify great hopes for the future.

Poisoning from Cheese.—Hylkema reports instances of gastro-enteritis affecting persons who had eaten certain cheeses. By exclusion he comes to the conclusion that the disturbances were the result of the contents of vesicles on the udders getting into the milk, as the cows had foot-and-mouth disease at the time. None of the cheeses were factory made. This same explanation fits also seven cases of acute gastro-enteritis with bloody vomit in two families from two to four hours after eating boiled buttermilk, although the existence of foot-and-mouth disease could not be affirmed.

Finska Läkaresällskapets Handlingar, Helsingfors

September-October, 1920, **62**, No. 9-10

*Pathogenesis of Dupuytren's Contraction. A. Krogius.—p. 489.
*Familial Brachydactylia. G. Renvall.—p. 507.
General Principles for Combating Infectious Diseases. E. Roos.—p. 513.
*Present Status of Roentgen-Ray Treatment of Tuberculosis. G. A. Wetterstrand.—p. 525.

Pathogenesis of Dupuytren's Contraction.—Krogius reproduces the genealogic tree of a family showing four generations with from one to six members in each generation with Dupuytren's contraction. In the two latest generations only male members are affected, but the anomaly was transmitted through both female and male members in the second generation. He has found records at the surgical hospital at Helsingfors of twenty-two cases since 1888, bilateral in twelve. Histologic examination in thirteen cases and research in comparative anatomy have confirmed the assumption of an embryonal predisposition, but traumatism certainly has a share in rousing the slumbering anlage.

Familial Brachydactylia.—Renvall adds to his previous compilation of congenital malformations the case of two sisters with pronounced brachydactylia and depressed carpophalangeal joints.

Roentgen-Ray Treatment of Tuberculosis.—Wetterstrand concludes from his review of the literature of the last few years that radiotherapy is becoming a powerful aid for certain forms of tuberculosis.

Hygiea, Stockholm

Oct. 31, 1920, **82**, No. 20

*Resection of Stomach for Cancer. W. Möller.—p. 641.

Resection of Stomach for Cancer.—Möller reviews 147 cases of gastric cancer at Lund treated by resection between 1893 and 1918. This group formed 22.3 per cent. of the total 659 gastric cancer cases during the period. Of the entire resection group only 17 are still living; in 6 the operation dates from less than three years. The interval since the operation in the other 11 ranges from three and a fraction to sixteen years. This group forms 13.4 per cent. of the 83 patients who survived the resection. He adds that comparison of the outcome in the 147 resection cases with that in 229 gastro-enterostomy cases, shows the advantages of resection whenever it is technically possible. In 11 cases of long survival the second Billroth method had been applied in all but 3.

Ugeskrift for Læger, Copenhagen

Nov. 4, 1920, **82**, No. 45

*Hemoptysis. E. Als.—p. 1389.
*Doses for Children. A. B. Heering.—p. 1393.
War Undernutrition. K. Baagøe.—p. 1396.

Treatment of Hemoptysis.—Als comments on the importance of getting extravasated blood out of the lung. Coughing must be suppressed for fear of detaching the obstructing clot, but the blood and sputum must be expelled by cautious hawking. It is not necessary to keep the patient in bed if he moves about cautiously, unless there has been loss of over 100 c.c. of blood, or there is fever. But even then it is not best for him to keep absolutely still. The necessity for ample feeding of the tuberculous patient must not be forgotten when he has hemoptysis. The anemia entailed by the hemorrhage must be combated. Primary fatal hemoptysis is extremely rare, but a clot may obstruct the vocal cords and can be removed by hand. In many cases the tendency to hemoptysis can be combated with calcium chlorid or an extract of blood platelets by the mouth. Even a teaspoonful of common salt swallowed dry or in solution will draw the blood to the digestive organs and thus lower the pressure in the lungs. This can be prescribed by telephone. The blood can be tied off in the limbs, but in this case the limbs must be released separately afterward, not all at once.

The Doses for Children.—A pharmacist in Copenhagen recently appealed to the public health authorities for the correct proportional dose for a child, in a dispute with a physician. He received the reply that there was no formula which could be applied with absolute reliability to calculate the doses for children. The text books in Denmark give usually the formula as the adult dose, multiplied by the age (in years) plus 3, divided by 30. Another much used formula is the adult dose, multiplied by the age, divided by the age plus 12. Monrad's formula is the adult dose, multiplied by the child's weight, divided by the average adult weight. Heering shows the wide divergence of the dose with these different formulas. At the age of one year, the dose would be respectively, 13.3, 7.7 and 14.1 cg. to each 1 gm. in the adult dose. Heering has worked out a formula for infants under 6 months old, namely, the adult dose, multiplied by 5 plus the child's age in months, divided by 100. This gives 5, 6, 7, 8, 9, 10, 11 and 12 cg. from birth up to the seventh month.